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SIDEWALK WORK IN CINCINNATI

Method Employed by the Sidewalk Division of the Engineering Department of Cincinnati, Ohio, in Securing the Construction of Sidewalks, Assessing for and Keeping Records of Same.

By D. L. BARR.*

Sidewalk improvements in Cincinnati, Ohio, may be brought about in either of two ways: First, property owners may, of their own accord, in compliance with written requests from the office of the Engineering Department, place their work in the hands of contractors; or, second, a motion may be introduced in the city council directing that a resolution be prepared providing that sidewalks be laid on a certain street. This resolution is then prepared by this office and transmitted to the city council; and, after its passage, property owners are served with notices in accordance with the same directing them to construct walks within a stipulated time. Should the work not be done by the property owners within this stipulated time, it is given to the city contractor for performance. In case the second method is followed it requires forty-five days after notice is given before the city can begin the laying of the sidewalk by its own contractors.

Practically only two kinds of sidewalks are now being constructed—concrete and plank. The city greatly prefers concrete walks, and believes that from the point of view of economy to the property owner himself, concrete walks are preferable to plank if they are to stay down not less than five years. The plank walks give both city and owners considerable trouble by frequent need of repairs. The city has no right, however, to force a property owner to lay concrete walks where streets are not permanently graded, and thus quite a number of plank walks are laid each year in the less thickly populated sections of the city.

When an order to lay a walk has been passed by council, notice of this is placed on a bulletin board in the city engineer's office for the information of all contractors, who may then endeavor to obtain the work from the property owners.

For the purpose of constructing walks by the city through the agency of city contractors when the property owners have failed to do so, the city is divided into four districts, the division being based as far as possible upon the cost of doing sidewalk work, and bids are let in the spring of each year for doing such work as may be required by the city during the year in each of these districts. A contract for each district having been awarded, all work which owners of property therein fail to do of their own accord throughout the year is given to the contractor of that district. During the year 1914 701,508 square feet of concrete sidewalks were laid in the city,

of which the city contractors laid 179,141, receiving for the same 12 cents in the district which comprises the business part of the city and 13 cents per square foot for the remaining part of the city. Of plank walks there were laid in 1914 70,259 feet b.m., of which the city laid 39,358 feet. (The city pays for corner intersections of walks in any case, and also, of course, for walks in front of public property.) The sidewalk work for 1915 has been let for 12 cents per square foot for the business district and 12½ cents for the remaining part of the city.

The specifications under which cement walks are constructed by city contractors provide for the following:

The trench is excavated 12 in. deep below finished grade and 3 in. wider on each side than walk, and filled with 8 in. of cinder base, a 3 in. concrete slab and 1 in. wearing surface. The sub-grade is thoroughly rammed and soft places filled with broken stone. Where necessary, 3-in. drain tile is laid half embedded in sub-grade and filled around with coarse cinders. The cinders, no piece exceeding 2 in. in size, are spread, wet and tamped or rolled in two 4-in. layers.

Two and a half parts of moderately coarse sand and five parts of broken stone passing a 1½ in. perforation, and larger than ¼ in., mixed with one part cement, are used for the concrete slab. The wearing surface is composed of 2 parts cement to 3 parts of washed bank sand screened through a No. 4 screen. This must be spread over the concrete before any set has occurred in it. The walk is cut into blocks by grooves five-eighths of an inch deep, ⅜ in. wide, at the bottom and ¼ in. at the top; blocks being from 4 to 6 ft. long.

When the sidewalk extends to the curb, its surface shall be ½ in. above the curb, slightly lapping onto it, with a beveled edge. The cross slope is ⅜ in. to the foot.

Quarter-inch expansion joints are placed at intervals of not more than 30 ft., and ½ in. joints adjoining curbs at street intersections.

Reinforced concrete slabs over areaways, etc., are paid for by force account, plus 15 per cent.

Cement driveways slope up from gutter to sidewalk level in 2 feet adjoining the gutter, and are constructed with 5 in. of cinders, 5 in. of concrete slab and 2 in. of wearing surface, the sand for the wearing surface being well graded from 1-32 in. to ¼ in. diameter (screenings may be used). The surface is not troweled too smooth and is blocked off into 6 in. squares.

The contractor must keep all work done by him in good condition and repair for one year from date of acceptance.

All of the control of sidewalk-construction being in the hands of the Sidewalk Division of the Engineering Department, the duties falling to this office, are:

1. To inspect sidewalk conditions on a particular street after motion in council has been adopted looking to sidewalk improvement.
2. To examine titles of all properties affected by the contemplated resolution for such improvement.

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3. To draw up a resolution containing descriptions of all properties affected.

4. To write out notices of contemplated improvement to be served on owners of such properties.

5. To serve such notices on owners.

6. To inspect and supervise such sidewalk work as owners may do voluntarily in accordance with such notices.

7. To see that all the work contemplated in the resolution is completed by property owners within the stipulated time, and if any have failed to do so, to notify the director of public service to this effect, whereupon he transmits an order to this office authorizing the placing of the work in the hands of the city contractor.

8. To give the city contractor detailed information concerning work he is to do in accordance with such order, and to supervise the same.

9. To measure such work and cause bills for same to be presented to property owners for whom the work was done.

10. To prepare assessing ordinance to enforce collection of any bills which are not paid within a stipulated time.

11. To investigate complaints of defective sidewalks and remedy conditions complained of and to discover and remedy as far as possible all other defects.

12. To keep records of all the above.

The prices paid by the city for sidewalk work in these contracts is lower than that for which the work can be obtained by property owners in many cases, and it is not unusual for the owner to request the city to put in the sidewalk. In this case, the owner is charged with the exact amount paid the contractor for this work; whereas, if he waits until his time limit expires and the city then does the work, there is added to this amount certain costs which add materially to the charge against the property owner, as described below.

In order to keep tab on the work as a whole, we use what is called our "Legislation and progress record." This is a record book ruled into a number of vertical columns, the headings of which are as follows: (1) Introduced by; (2) Number of motion; (3) Street; (4) Between; (5) Motion passed; (6) Plat inspected; (7) Plat examined; (8) Resolution number; (9) Resolution passed; (10) Notices written; (11) Notices served; (12) Contract order number; (13) Order signed; (14) Time on which final notice expires; (15) Contractor notified to proceed; (16) Work under way; (17) Work completed; (18) Work measured; (19) Remarks. The entries under these column heads are dates in all cases except the first four and the twelfth columns. This record, therefore, gives a history of this particular case from the first introduction of the motion to the final closing of the contract.

The form of the index to the actual records of all legislation and to the cost ledger is shown in Fig. 1.

All contractors in this city who lay cement sidewalks are under bond and no sidewalk can be laid without a permit from this office. Thus the department can know the location of all work so as to send inspectors there to supervise it. These permits are indexed on a sheet ruled into six columns, the headings of which are: (1) Num-

| STREET | BETWEEN | AND | REF. NO. | BOOK No. | PAGE | ORDER No. | Computation Sheet No. | Assessment Sheet No. | PAGE |
|--------|--------------|------------------|----------|-------------|------|--------------|--------------------------|-------------------------|------|
| Bergen | Spring Grove | C. & G. D. R. R. | 2817 | 13 | 280 | 1419 | Q65116 | 3 | 800 |
| Bergen | Stebelton | Callan | 2818 | 13 | 281 | 1420 | Q65116 | 3 | 791 |
| Bleman | Blent | Ginalay | 2867 | 14 | 45 | 1454 | Q65121 | 3 | 805 |
| Breman | York | Ginday | 2868 | 14 | 46 | | | | |
| Brett | Carl | Philadelphia | 2920 | 14 | 118 | | | | |

FIG. 1—INDEX TO RECORDS.

ber; (2) Street; (3) No. or side; (4) Between; (5) Owner; (6) Paver.

For reference, the bids of successful contractors for each year are kept on a form similar to that shown below:

Cement Sidewalks—Estimated Quantities and Price Bid—District No. 2.

| Item | Year— | 1914 | | 1915 | |
|---------------------------------------|-------|-------------|----------------|------------|------------------|
| | | Contractor— | Chas. Kuhl Art | Stone Co. | Fr. C. N. Danen- |
| 1 Constructing cement walks.sq. ft. | | 50,000 | 130 | 70,000 | 1240 |
| 2 Repairing cement walks..sq. ft. | | 1,000 | 001 | 500 | 0001 |
| 3 Chipping out flags and sur- | | | | | |
| facing with cement.....sq. ft. | | 100 | 001 | 100 | 0001 |
| 4 Cement driveways and | | | | | |
| crossings | | 1,000 | 100 | 500 | 0950 |
| 5 Vit. brick driveways and | | | | | |
| crossings | | 1,000 | 001 | 500 | 0001 |
| 6 Broken or crushed stone..cu. yd. | | 50 | 001 | 10 | 0001 |
| 7 Curbs, granite | | 100 | 001 | 50 | 0001 |
| 8 Curbs, limestone | | 100 | 001 | 50 | 0001 |
| 9 Cement combined curb and | | | | | |
| gutter | | 200 | 001 | 50 | 0001 |
| 10 Curbs reset and redressed.lin. ft. | | 1,000 | 001 | 1,000 | 0001 |
| 11 Concrete masonry | | 1,500 | 001 | 1,500 | 0001 |
| 12 Reinforcing steel | | 500 | 001 | 300 | 0001 |
| 13 Grading excavation | | 500 | 001 | 1,000 | 0001 |
| 14 Grading embankment | | 500 | 001 | 500 | 0001 |
| 15 Removing trees | | 100 | 001 | 20 | 0001 |
| 16 Drain pipe, 3-inch.....lin. ft. | | 200 | 001 | 100 | 0001 |
| 17 Resetting stone steps and | | | | | |
| stone around cellar door.cu. ft. | | 100 | 001 | 25 | 0001 |
| 18 Reinforced concrete, see Item 41. | | | | \$6,606.95 | \$8,928.09 |

Plank Sidewalks—Estimated Quantities and Price Bid—Western District.

| Item | Year— | 1914 | | 1915 | |
|------------------|-----------|-------------|---------------|-------------|-------------|
| | | Contractor— | Frank Broeman | Fr. Broeman | Quan. Price |
| New Lumber | Ft. B. M. | 100,000 | 35.00 | 100,000 | 36.00 |
| Old Lumber | Ft. E. M. | 30,000 | 5.00 | 30,000 | 1.00 |

As stated in item No. 8, it is necessary to give the city contractor specific and detailed instructions as to the work he is to do, and a form has been devised for this purpose; such an order reads as follows:

CITY OF CINCINNATI.
ENGINEERING DEPARTMENT
Nov. 5, 1913

The C. A. Dugan Co.

City Contractors, District No. 2.

You are hereby directed to proceed with the following sidewalk work on Liberty Street, as authorized by the Director of Public Service on Nov. 1,

| Front- | House No. or | Location of work by | |
|---|--------------|-----------------------------------|-------------|
| Owner. | age. Width. | Description. | Owners Add. |
| John Smith..... | 70 5 | W. Side beg. at S. line of 3d av. | 422 Pearl |
| Eli. Charles..... | 50 5 | W. Side beg. 95' S. of 3d av. | 455 Main |
| John Jones..... | 25 5 | 205 Liberty st. | 205 Liberty |
| Extra—Construct one block (2.5 by 4) opp. house walk. | | | |
| Special mention: | | | |
| Excavation to be carried to property line. | | | |
| Work to be started within ten (10) days and completed within twenty (20) days from date hereof as per contract. | | | |
| By order of Sidewalk Engineer. | | | |

| OWNER | LOT NUMBER OR FRONTAGE | MEASUREMENTS | | | | | | ASS. SHEET MADE | ASS. ORD. WRITTEN | |
|--------------|------------------------|--------------------|-----|---------|------------|--------|----------------|-----------------|-------------------|-------|
| | | FIELD MEASUREMENTS | | SQ. FT. | UNIT PRICE | AMOUNT | BILLS APPROVED | CONTR. PAID | COST OF ADV. | TOTAL |
| John Smith | Land 2 | 70x5 | 350 | .1 | 42.00 | 168.00 | 200 | 200 | 44.00 | |
| Eli Charles | | | | | | | | | | |
| Mary Charles | 4 Land 5 | 50x5 | 260 | 1 | 31.20 | 1 | 0.00 | | | |
| John Jones | 7 | 25x5 | 125 | 1 | 15.00 | 1 | 200 | 200 | 17.00 | |

FIG. 2—HEADING OF LEDGER.

After the city contractor has finished his work, the same is measured by this office and the measurements transmitted to him. The contractor then makes out bills to property owners and these are approved by this office before being presented by him. At the close of the season the contractor gives this office information as to what bills are paid and the city then passes an assessing ordinance to collect all unpaid bills. This necessitates expenditures for advertising, the cost of which is borne by those persons appearing on the assessing ordinance. All of this information is recorded on a computation sheet as shown in Fig. 2. Of course the column headed "Assessment" is not filled in until just prior to preparation of the assessing ordinance. However, before the ordinance is passed a record of the work which is done by the city contractor under his contract must be filed with the Director of Public Service. Such a record is shown in Fig. 3.

A convenient form of keeping a record of work performed annually is shown in the accompanying tables:

FIG. 3—SIDEWALK ASSESSMENT SHEET

| SIDEWALK COMPLAINT 300 | | | |
|----------------------------|-------------|--------------|--|
| STREET | No. or SIDE | BETWEEN | |
| DATE OF COMPLAINT | 191 | KIND OF WALK | |
| OWNERSHIP REPORTED | | | |
| OWNERS ADDRESS REPORTED | | | |
| CONDITION OF WALK REPORTED | | | |
| COMPLAINT BY | | | |
| ENGR IN CHARGE | | | |

FIG. 4—COMPLAINT CARD, FORM A.

| | | | |
|--|-----------|-----------|-----------|
| Total cost cement walks const. by city cont. | 23,480.34 | 14,684.74 | 22,957.54 |
| Cost of work assessed on city for plank walks.... | 22.32 | 31.81 | 5.92 |
| Cost of work assessed on priv. prop. for plank walks.... | 1,659.63 | 2,051.36 | 1,369.69 |
| Total cost of plank walks const. by city cont. | 1,681.95 | 2,083.17 | 1,375.61 |
| Grade stakes set (lin. ft.)... | 400 | 353 | 325 |
| Tracings from county records | 78 | 100 | 84 |
| New streets numbered | 730 | 1,950 | 400 |
| New house numbers given... | | | |

Cement Sidewalks—Constructed by City Contractor.

| Year 1914. | | | | |
|-----------------------------------|------|----------|-----------|------|
| | Unit | Sq. ft. | Price | Amt. |
| District 1. | | 13 | | |
| City's portion | | 2,240.0 | \$ 291.30 | |
| Assessed on private property..... | | 34,266.5 | 4,454.67 | |
| Total | | 36,509.3 | 4,745.97 | |
| District 2. | | 13 | | |
| City's portion | | 4,951.3 | 645.67 | |
| Assessed on private property..... | | 61,366.8 | 7,977.71 | |
| Total | | 66,318.1 | 8,621.38 | |
| District 3. | | 13 | | |
| City's portion | | 3,938.5 | 512.01 | |
| Assessed on private property..... | | 39,161.7 | 5,091.02 | |
| Total | | 43,100.2 | 5,603.03 | |
| District 4. | | 12 | | |
| City's portion | | 2,134.6 | 258.14 | |
| Assessed on private property..... | | 31,081.0 | 3,731.02 | |
| Total | | 33,215.6 | 3,989.16 | |

Plank Sidewalks—Constructed by City Contractor.

| Year 1914. | | | | |
|-----------------------------------|------|----------|-------|----------|
| | Unit | Ft. B.M. | Price | Amt. |
| Eastern District. | | | | |
| City's portion | | 3,824 | 35 | 133.85 |
| Assessed on private property..... | | | | |
| Total | | 3,824 | | 133.85 |
| Western District | | | | |
| City's portion | | 349 | 35 | 12.22 |
| Assessed on private property..... | | 35,121 | 35 | 1,229.54 |
| Total | | 35,534 | | 1,241.76 |

To keep a record of complaints and to handle them, the card scheme as devised by the Street Repair Department of this city was adopted. These cards are bound in books of fifty each and are in duplicate with a perforated line for tearing the duplicate from the original, which remains as a stub. The card itself is of a brilliant red and the forms printed on the front and back of same are as shown in Fig. 4. As a complaint is received it is written in pencil on Form A of the original card and on the same side of the duplicate card. The duplicate is then torn out and given to the inspector, who investigates and makes a report in the place provided on the reverse side of the duplicate card, shown by Form B. He then returns the card to the office and necessary action is thereupon taken and record of such action is noted on the lower part of the card. This card is then filed and the original A is checked. By looking through the book of originals, it can be determined whether any cards have not been returned.

| REPORT | | | |
|---|-------------|--------------|--|
| STREET | No. or SIDE | BETWEEN | |
| INVESTIGATED | 191 | KIND OF WALK | |
| ACTUAL OWNER | ADDRESS | | |
| FT. FRONT BEGINNING | | | |
| CONDITION OF WALK | | | |
| BY | | | |
| ACTION: NOTICE TO _____ NO. _____ DATE 191 | | | |
| LETTER TO _____ FILE _____ DATE 191 | | | |
| PERMIT No. _____ DATE 191 WORK DONE 191 | | | |
| (MATTER DROPPED). (UNABLE TO GET ACTION) 191 | | | |

COMPLAINT CARD, FORM B.

No attempt has been made to show records of any but cement sidewalk work in the above forms, but we handle plank walk work in the same manner, and brick work could be handled equally well.

I might suggest to contractors doing much sidewalk work that the form shown in Fig. 2 would be very adaptable to use by them as a ledger sheet, with slight modifications. Of course, the column headed "Assessment" would be useless to them.

This is not an article intended to show how work of this character *should* be done, but to show how it *may* be done. No claim is made that the system is perfect nor that it would be adaptable to every town or city. However, our experience has shown that it answers our need effectively, is a labor-saver, and surely a decided improvement over former methods used in this office. Any suggestions as to improvements in this system would be thankfully received by the author.

ASPHALT AND WOOD FIBER PAVEMENT.

By CHARLES CARROLL BROWN.

Some years since a mixture of asphalt with cork particles was tested as a paving material and proved successful, but was too expensive for general use, though it finds various special applications where it demonstrates a value equal to its cost.

A pavement has just been laid in Charleston, W. Va., which is made of asphalt cement, some mineral matter and chestnut wood fiber from which the tannin and similar removable ingredients have been taken by processes of which the fiber is a by-product. This pavement promises success equal to that of the cork pavement, and it can be laid at an expense comparable with that of other good pavements now in use.

The photograph shows the preparation of the paving mixture for laying on concrete foundation on Morris Street, Charleston, W. Va., by a gang of expert asphalt pavement layers and rollers, under expert plant and street foremen, the general methods of operation being similar to those on other asphalt pavements. A squeegee coat and a sprinkling of stone dust is put on the pavement after the first rolling and it is then thoroughly compressed by continued rolling.

The pavement is not slippery, and is practically noiseless, the click of horses' shoes being entirely absent. It is resilient and indentations by carks of shoes or narrow tires iron out under traffic even more readily than in other sheet pavements.

The pavement was laid with the new Hetherington and Berner portable road plant for laying asphalt mixtures, with some additions of draft controls, devices for emptying the drum, etc., and change in mixer arms to adapt it to the lighter weight of the wood fiber, and to protect

the wood from charring in the dryer. The wood fiber is fed to the elevator at the right, run through the dryer and the screen at the top of the tower over the mixer, whence it is weighed with the mineral matter and the hot asphalt into the mixer and is then hauled in hand carts to the street at the left of the photograph.

The Wood Fiber Asphalt Company of Charleston, W. Va., which owns the patents, is developing the pavement and the Central Engineering Company of the same city was the contractor on Morris street. They have employed chemists, engineers and expert workmen in the effort to lay the best pavement possible and have followed the standard specifications for asphalt cement and filler adopted by the associations of municipal officials.

Two blocks of Morris street, on which the pavement was laid, are on about a one per cent grade and have concrete combined curb and gutter and 5-inch concrete foundation. The street is 605 feet long and the fibered asphalt surface is 27 feet wide. The traffic over the street is perhaps the heaviest in Charleston, being to and from two freight depots, and the pavement will have an excellent test of its wearing qualities. One small sample pavement laid by an experienced asphalt contractor in Memphis, Tenn. (see Municipal Journal for January 16, 1913) has been down over two years, and its behavior warrants the belief that this pavement will prove durable.

TUNNEL STREETS AT SAN FRANCISCO.

By T. A. CHURCH.

Four years ago a movement was begun at San Francisco, Cal., for the construction of several tunnels through the steep hills of that city to connect the business district with desirable residence sections that were then reached only by making wide detours. Since that time plans have been drawn for two tunnels, and one of these, the Stockton street tunnel, has been completed and placed in service, with a branch of the Municipal Railway running through it.

The Stockton street tunnel is on the street of that name and connects the business district with what is known as the North Beach section. Its total length, in-

cluding the approaches, is 1,324 feet, while the tunnel proper from portal to portal is 911 feet. The width is fifty feet, the height eighteen feet, thickness at base eight feet and thickness of roof 2.8 feet. Slightly more than 43,500 cubic yards of material was removed and 16,500 cubic yards of concrete was used in its construction, together with 637,000 pounds of steel. The total cost of the tunnel aggregated \$621,000, of which amount \$430,000 went into actual construction work and \$191,000 was paid to property owners for damages. Funds for the construction of the tunnel were secured by assessments on property that would be benefited.

Tentative plans were prepared for connecting the Fillmore street district with Harbor View, the site of the Panama-Pacific International Exposition, but these were set aside for the present when it was shown that the work could not be completed in time for the Exposition and would be an eyesore. It is anticipated that these will be revived at a later date.

The most ambitious plan considered was for constructing a tunnel under Twin Peaks, an eminence over nine hundred feet high and a barrier to rapid transportation to the westward. This tunnel has been planned for a double-track electric railway, and is to provide convenient access to an area of seven thousand acres which it is desired to develop as a residence district. The east portal will open on Market street, the principal artery of the city, and the west portal will be in the center of the new home-site tract. The length between portals of this tunnel will be 12,000 feet and the time of transit for express trains is estimated at five minutes.

Funds for the construction of the tunnel have been obtained by assessments on property that will be benefited by the improvement. The total cost, including right-of-way lands, is estimated at \$3,994,289, and of this amount \$3,398,972 will be contributed by property holders having lands west of the tunnel, the remainder to be assessed from a small tract east of the peaks. The assessment rate ranges from $\frac{1}{2}$ to $3\frac{1}{2}$ cents per square foot, averaging about 2 cents, property owners having the option of paying these assessments in full, or in ten annual installments, deferred payments bearing 7 per cent interest.



ASPHALT MIXING PLANT PREPARING WOOD FIBER ASPHALT MATERIAL.

The selection of tunnel grades was influenced by two considerations, the desirability of locating a station within a reasonable distance below the surface at a point about 3,000 feet from the west portal, to be known as Laguna Honda station, and the necessity for keeping the grade down to a maximum that would permit of high speed. Both these considerations were satisfied by an ascending 3 per cent grade from the east portal to Laguna Honda station and a descending grade of 1.15 per cent from this point to the west portal. On curves the maximum grade was reduced to 2.87 per cent.

Two stations are to be provided. The most important one will be Laguna Honda station which will be located 62 feet below the surface. Beside the tracks in this stations, platforms 10 feet wide and 300 feet long will be built and six 50-passenger elevators are to be installed. All of the surface depots are to be reinforced concrete structures finished in the Mission style of architecture.

In order to ascertain the character of the material to be encountered borings were made along the route at intervals of about 350 feet. These borings indicated that, for a distance of 5,000 feet on the westerly end, sand and incipient sandstone will be encountered, passing then into hard Franciscan sandstone for a distance of 4,500 feet and emerging therefrom into a red sandy clay for the remaining 2,500 feet to the easterly portal.

The inside dimensions adopted for the tunnel proper are 25x18 feet, and the arch is to be practically semicircular. In the floor design an inverted arch will be used. Throughout the length of the tunnel the contractor is given the option of using brick or concrete in the upper portion of the arch ring, but concrete is specified for the remainder of the cross-section. Limited clearance near the east portal will prevent the use of the standard circular arch on this part of the line, and for a distance of about 1,650 feet a double compartment subway with a slab top was designed.

A vitrified pipe is to be laid beneath the crushed rock ballast to carry off the seepage water which will gain access to the tunnel through weep holes placed in the base of the walls at intervals of about 25 feet. Near stations, where leaks would be particularly unsightly, three-ply felt waterproofing is to be laid on the top and sides of the structure and covered with porous tile so that seepage can readily percolate to the weep holes. Throughout the entire tunnel a 12 per cent mixture of hydrated lime will be added to the concrete as a waterproofing measure, and in addition a rich mixture of cement and sand is to be applied to the interior surface with a cement gun.

A horizontal slab of concrete is to run through the tunnel 5 feet below the crown of the arch so as to close off this part of the cross-section for service as an air duct. This slab will have a thickness of 4 inches and a span of 19 feet, its weight being supported by 1-inch steel rods from the arch above, spaced 10 feet apart on center line. Motor driven blowers in two ventilating shafts will force fresh air down into this duct, whence it will escape into the main tunnel through openings controlled by dampers, and will find its way out at stations or portals. The design will permit of the use of either a third rail or trolley system and the location and elevation of the eastern portal are such that the tunnel can be continued as a subway under Market street with but slight alterations.

A contract for the construction of this tunnel has been let to a local contracting firm and since the first of the year active work has been commenced at both portals. The work is to be completed within six hundred days.

CONSTRUCTING CONCRETE CURBS

Experience of the Author in Developing a Satisfactory Form of Curb and Sidewalk to Resist Fracturing at Corners.

Editor Municipal Journal, 50 Union Square, New York:

Dear Sir—I notice on page 219 of your issue of February 18, 1915, an article by city engineer Gehres, of Akron, Ohio. In his article mention is made of the very large number of feet of concrete curb laid in 1913, 52,979 lineal feet and only 9,309 lineal feet of stone curb, whereas in 1914 79,031 feet of stone curb was laid and only 18,731 lineal feet of concrete curb and gutter. Mr. Gehres follows by stating that many complaints had been made against the concrete curbing, so that the property owners were willing to pay 50 cents for a stone curb and an additional 33 cents for concrete gutter in place of 55 cents for a combined concrete curb and gutter, and that generally speaking the property owners are demanding the stone curbing instead of the concrete because of the defects in the building of the concrete curbing.

The writer has had considerable experience in the building of concrete curbing, the laying of sidewalks and the building of street pavements. Where concrete curbing is properly made there is little question that its general appearance is much better than any except the best dressed granite. It is also true enough that it is not so much the fault of the concrete as the fault of those using it that caused failures of concrete curbing. Winter, as well as summer, tries out concrete curbing, so that each passing season has its effect. Then the conditions under which a curb was built has everything to do with its lasting qualities.

The following sketches and information show the manner in which a satisfactory concrete curb and sidewalk can be constructed at street intersections, which is one of the most important points for consideration.

In preparing plans for street work, including curb and sidewalks, and engineer should not forget that a street is constantly called on to withstand:

First—The action of the elements; heat—causing expansion; cold—causing contraction; with the corresponding action of all bodies surrounding the said street, etc., whose forces are exerted in lines tending to disrupt the structure. A street may or may not receive a great deal of traffic, but when the wear and tear of traffic are added to the forces already at work it is readily understood that a street is constantly worked day and night. Hence, unless the greatest care is observed during construction and the very best material selected, it is more

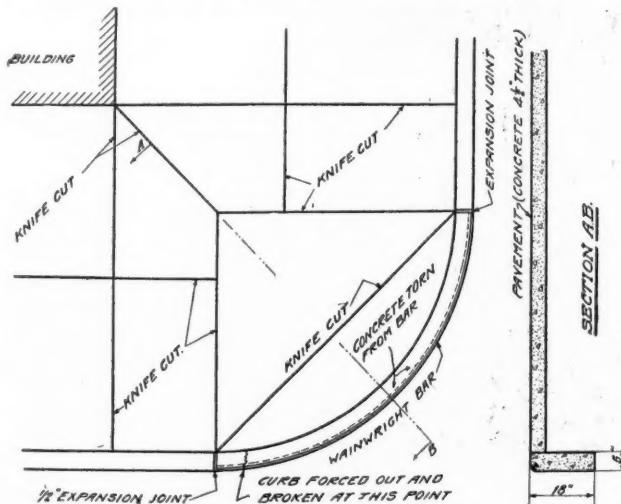


FIG. 1—FIRST DESIGN FOR STANDARD CORNER.

than likely that neither street work nor curb will be satisfactory.

Concrete is more open to attack from atmospheric conditions than many other materials. Its contraction and expansion far exceeds that of stone. It is more porous and hence subjected to greater internal stresses from heat and cold.

From his own experience, however, the writer is personally in favor of concrete curb over stone. More even and prettier work can be had. It maintains its line better. It gives a better line to work concrete pavements to, grass and weeds will not grow so readily between its joints.

The weakest point of a concrete curb is at street intersections, and many towns have been trying to get a concrete curved curb that could not be pushed out and would not break up from the expansion in a sidewalk between blocks.

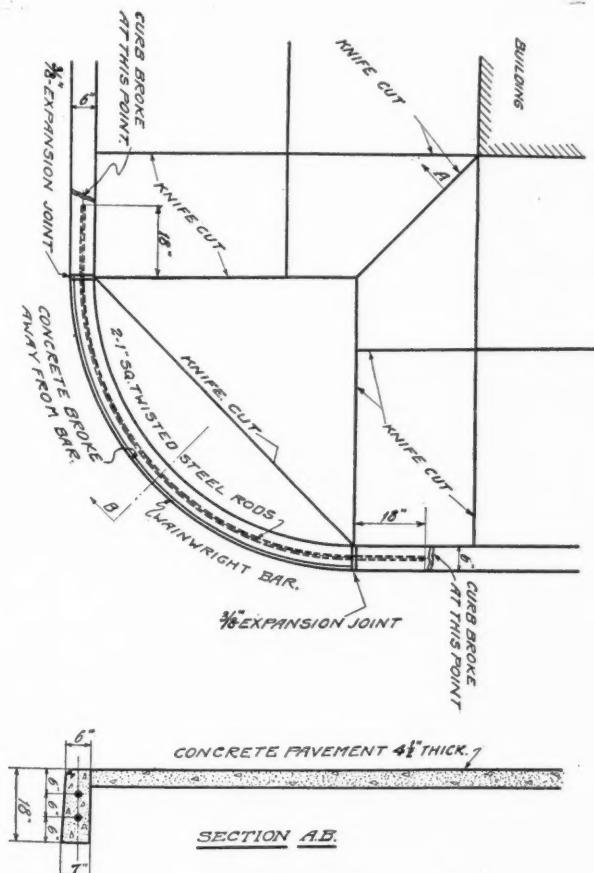


FIG. 2—SECOND DESIGN.

After many trials a standard design is now used by the writer. The radius used is 6 feet whenever possible. Fig. 1 represents the first curved curb used. The Wainwright corner bar was used and a half-inch expansion joint placed at each end of curve. At the end of the first year this curb was broken all to pieces and the corner bar shoved into the street. The curb was 5 inches thick throughout and 18 inches deep. Specifications in each case were the same.

Fig. 2 was thickened at the top to 6 inches and made 7 inches at the bottom. The depth of the curb was 18 inches, the batter, made on the outside of curb, being 1 inch in 18 inches. This curb was also reinforced with two 1 inch twisted steel bars placed 6 inches and 12 inches below the top of the curb respectively, and in the center of the curb. A three-eighths-inch expansion joint was left at the tangent points.

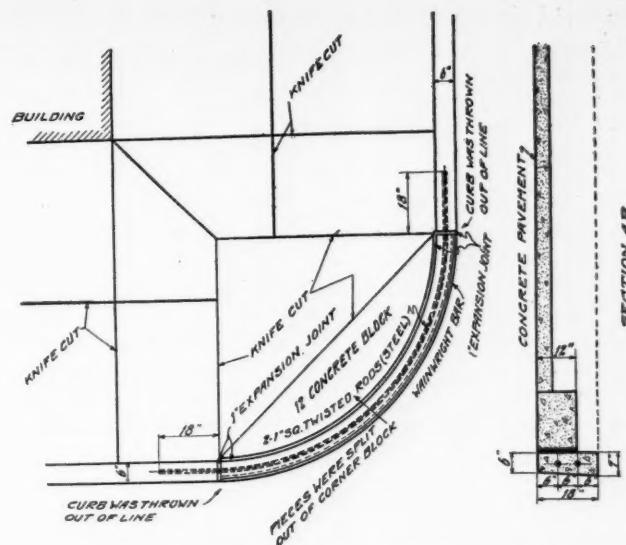


FIG. 3—THIRD DESIGN.

The steel extended into the straight curb 18 inches. The face of the curb was also lined with the Wainwright bar. The force of the expansion of the sidewalk tore the Wainwright bar loose, split up the concrete and cracked the curb off at the end of the steel in the straight curb, which necessitated taking out the curb and replacing it, as it was dangerous to pedestrian as well as vehicular travel.

Fig. 3 shows the next step taken to overcome the expansion of the sidewalk where the workmen had failed to leave joints or sufficient joints. A 1-inch expansion joint was left immediately back of the curb proper at the corner, the curb being made the same in all other respects as before. In this instance the asphalt strips were squeezed out. The circular part of the curb was cracked in many places and one end was raised up in the air about two inches, causing people to trip over the same. Parts of the concrete sidewalk directly back of the circular part of the curb spawled off 1 inch thick and 6 inches long. Hence it was necessary to replace the corner. This occurred where the buildings along the street were brick or stone and the sidewalk had to move out or push the building back; the curb between squares raised the end of the curb at the tangent point. One would hardly have believed these conditions unless they had personally observed them.

Fig. 4 shows the successful concrete corner. The curb proper and its protecting ledge must be made in one piece and should be not less than 3 feet wide at the center of the curve. The expansion joint should be placed where shown by the double lines and the concrete made thicker, as shown. This will successfully resist the pressures through the square, although occasional spawling results where the expansion joints are shown. The material used in making the joints should be a made-up strip of asphalt and not a poured joint. The expansion of the concrete will gradually close up this wide joint. You will note that the curb is made 18 inches deep, the protecting ledge 12 inches deep and the remainder of sidewalk ordinary thickness. (In some instances it is customary to make pavement between expansion joints one-

The building tends to crack the concrete along each line or face. This is cared for by the expansion joint and should be kept in mind.

All the concrete should be laid at one operation. The steel edge should be maintained to guide wagon wheels. The expansion joint should also be placed along the outside of curb next to street pavement, as shown. Provision

is made for expansion of sidewalk and street in this manner.

The specifications call for concrete mixed one part cement, two parts of sand and four parts of stone, except the last two inches of top. This is put on before the lower 16 inches of curb has begun to set and is mixed one part of cement, one part of sand and two parts of trap rock screenings without dust. The stone used for making the body of the curb must be retained on a half-inch mesh and pass a one-inch mesh. All the screenings must pass a one-half-inch mesh.

The straight curb is made in 8-foot lengths when no corner bar is used and in 10-foot lengths when the same is used.

The curb is covered with boards until it hardens. Mud, sand, or other earth is then placed on top and kept wet for four days.

As soon as the forms are removed, when the concrete is not over forty-eight hours old, a mixture of cement and screened stone-dust, in equal parts, is skimmed over the surface and trowel rubbed to smooth face.

No trouble has been experienced with any straight curb when the joints were made three-eighths-inch wide and the cut made entirely through.

All concrete must be properly mixed, the concrete properly spaded to bring the cement to the face of the

HERBERT W. HATTON,
Wilmington, Del.

EXPANSION IN CONCRETE SIDEWALKS.

The letter from Mr. Hatton given above details what has in general been the experience of a great many engineers, although few possibly have persisted in changing the construction until reaching one which has proved satisfactory. Concrete sidewalks may be generally divided into two classes with reference to expansion troubles—those in which there is a strip of earth between sidewalk and curb, except at street intersections, where the sidewalk pavement is continued to the curbs (this is shown on the accompanying plan); and those in which the concrete sidewalk covers the entire surface from the buildings on one side to the curb on the other. In the latter construction there will almost invariably be a durable pavement on concrete foundation extending across the roadway from curb to curb, while such pavement may or may not exist in the other case.

Concrete expands by an appreciable amount under the effects of either heat or moisture, late investigations indicating that moisture has even more expansive effect than heat. This tendency to expansion is very powerful and yet not irresistible, as is seen from the fact that a continuous mass of concrete extending from building line to building line across the street could not expand without moving the walls of the building, which it apparently does not do. In such cases there is, of course, an internal compressive stress produced by the pressure of the structures which prevent the expansion. In the first class of pavements referred to above, the sidewalk tends to expand and the longitudinal expansion is resisted only by the curb across the end of the sidewalk. If this is not sufficiently strong and well anchored to resist the force of expansion, it is pushed outward. When the sidewalk contracts again, the tendency is for each block to contract individually, widening the joints between blocks, which then fill with dirt, small stones, etc., which tend to render permanent this widening of the joint. When the pavement next expands, it therefore pushes the end section a little further, and so by small increments the end of the pavement creeps gradually further and further from its original position. It would seem therefore that either the curb at the end of the sidewalk

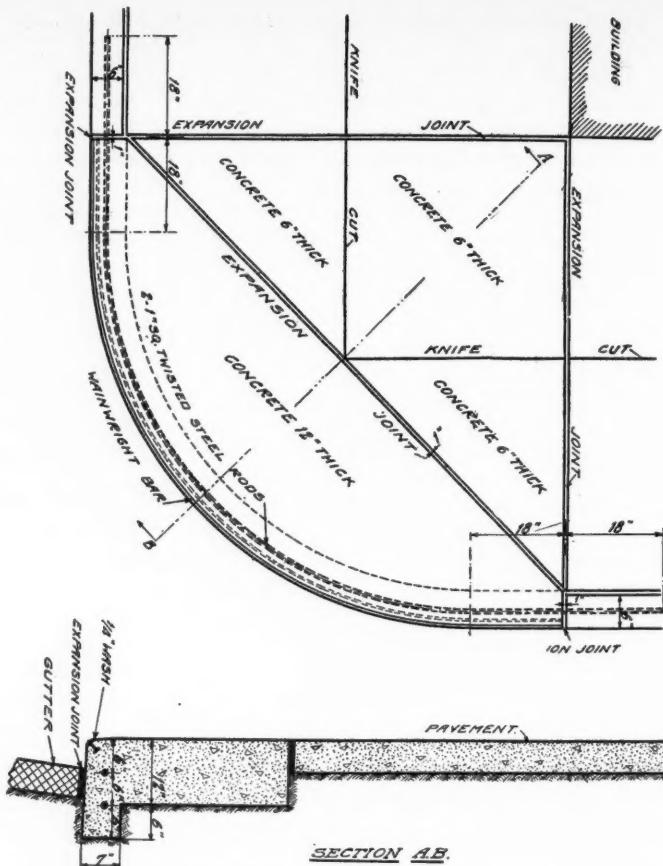


FIG. 4—SUCCESSFUL CONCRETE CORNER.

must be sufficiently strong and well anchored to resist the thrust of expansion, or it must be allowed to move, with serious detriment to its usefulness and appearance. There is, however, a third alternative, that of so designing the construction that the expansion may expend itself in some other less objectionable direction. Such an idea is indicated in the sketch, Fig. 5, in which the pavement is cut into two wedge-shaped blocks adjacent to the intersection. The two heavy blocks at the corner furnishing considerable resistance, which is greatly assisted by the foundation of the roadway pavement, these two wedge-shaped pieces marked c c will have the tendency to move inward from the curb, which movement is resisted only by the soil, which resistance would presumably be considerably less than that offered by the corner pieces. Weak points in this construction would be the acute angles caused by the diagonals, but this point can be strengthened by beveling the edge of the pavement so as to give the pointed end of the block a triangular rather than a knife-edge section. This beveling of the edge would also assist somewhat in permitting the blocks to move as intended, by causing the earth to slide up the inclined edge. This would, of course, throw the wedge-shaped blocks slightly out of line, but this would not be nearly as objectionable as the same amount of movement in the curbs. A strip of thin metal left in the diagonal joints would facilitate this movement.

Another method of treating the problem would be to carry the sidewalk pavement continuously to the face of the curb, as shown in the lower cross-section in the sketch, resting it upon the concrete or other gutter material, which at this point is carried back under the curb; placing a joint of about a sixteenth of an inch of tar between the under side of the sidewalk concrete and the gutter, which tends both to make this joint watertight and also to permit sliding under temperature expansion and contraction. Reinforcing rods would then be carried

back through several of the sidewalk sections, being especially well anchored near the curb line so that movement of the sidewalk due to expansion should not be permanent. With such construction, the face of the sidewalk in line with the curb would move very little out of line.

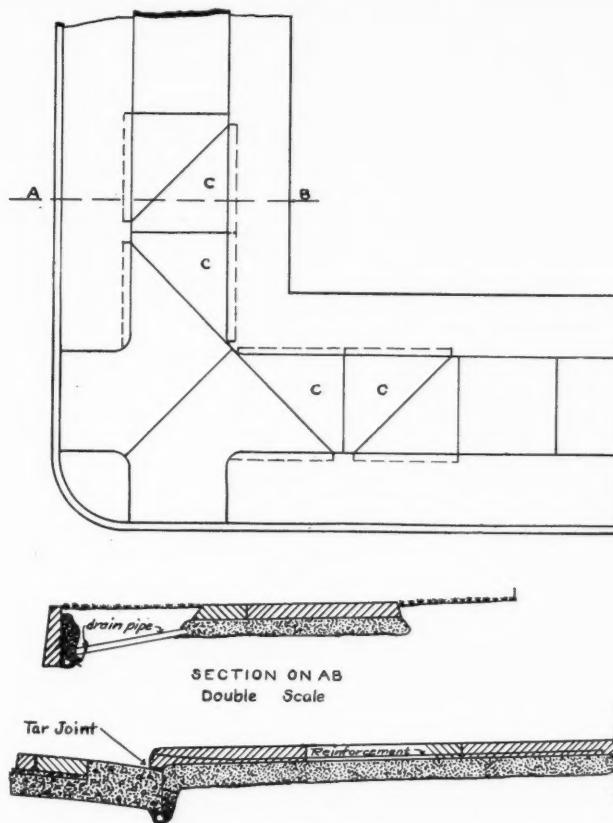


FIG. 5—PROPOSED CONSTRUCTION OF CONCRETE SIDEWALK.

Should this movement become objectionable in amount, the concrete could be cut back and refaced at comparatively small expense.

Probably the simplest method of attempting to overcome all of this expansion trouble is to use expansion joints. These have, we understand, given satisfactory service in some cities, but owing to the comparatively weak resistance to expansion offered by a light curb, we anticipate that under many conditions it will not prove a sure remedy.

The second case, that of a sidewalk continuous from building to curb, is the most difficult to treat, because here no motion is possible without overthrowing the curb, except such as is provided for by open joints, whether filled with expansion material or not. The force exerted against the upper edge of a curb by such a sidewalk and a similar force exerted by a concrete roadway foundation at about mid-depth, can be successfully resisted only by the strongest curbing, such as heavy granite or a very heavy concrete. In some cities this difficulty has been met by carrying the sidewalk concrete across the top of the curb, but the joint between the sidewalk concrete and the top of the curb is almost sure to weather or otherwise break into an open joint which is disfiguring and very apt to increase until the edge of the sidewalk becomes very ragged. What seems to us a more satisfactory plan has been adopted in a number of cases in both large cities and small towns. This is the construction shown in the lower section of the accompanying drawing and already suggested a few lines above for the intersection of narrow sidewalk and curb. It consists in not using any curb at all, strictly speaking, but in finishing off the edge of the sidewalk so that it takes the place

of the curb, this edge resting upon the concrete or other gutter as shown. (This assumes that concrete curb would be used and is sufficiently durable for this location. Should granite or other more substantial material be desired, the ordinary construction would of course be used.) Here also there would be a slight tendency to progressive motion due to dirt sifting into the joints when the pavement contracts, but this motion would not be considerable nor its result serious. If it is desired to avoid it, however, reinforcing rods could be used, tied back into the inner block. They could be anchored either by bending the forward end of the reinforcement, by using an anchor plate, or by anchoring the rod in a plate used for protecting the edge of the curb. In some cities the entire face of the curb, in streets where traffic is heavy, is protected by a steel plate extending from the gutter to the top of the curb, the reinforcing rods being provided with heads which are countersunk in the face of this plate. The strength of the reinforcement should be sufficient to overcome the friction of the sidewalk sliding on the cinders beneath it and on the gutter as it contracts to its original position. The cost of this reinforcement would be less than that of providing a substantial curb as in ordinary construction.

Curbs are often thrown forward by the expansion of freezing ground. This can be prevented by insuring that the ground behind the top half of the curb is kept drained. Where the ground is naturally sandy or gravelly, and there is any outlet for the ground water close to the surface, there is generally no trouble of this kind. Where the ground is of clay formation, however, it is desirable to place gravel, broken stone, clean cinders or some other material which will readily allow water to pass through it, from the base of the curb up to within an inch or two of the surface, placing on top just enough soil to provide for the roots of sod. It is desirable to connect this curb drainage, either continuously by a layer of gravel or at intervals of ten to thirty feet by small pipe, with the porous foundation provided under the sidewalk pavement to drain the latter. This construction will permit the water to drain to the bottom of the curb, but unless it is removed from there this will be of little benefit. Where the grade is fairly steep, all that is ordinarily necessary is to provide an outlet for this blind drainage system into the sewer catchbasins or whatever other outlet is available. It is safer, however, especially where such outlets are very infrequent or where the grade is quite flat, to place a small tile drain behind the curb at its base in order to remove the water which seeps to this point.

PAVING ALONG STREET RAILWAYS.

Scattered over its 615 miles of paved streets, the City of Cincinnati, O., offers illustrations of a great variety of methods of paving against and between street railway tracks. When street asphalt was found to go to pieces along rails which moved under passing traffic, stone blocks were laid in a strip along each side of each rail. At first two rows were laid lengthwise in each strip but the longitudinal joints rutted badly and this practice was changed to that of laying the blocks at right angles to the rails the strip consisting of alternate rows of two whole blocks, followed by one whole block and two half-blocks, in order to break joints. This granite strip is used in connection with a general pavement of wood block, asphalt or bitulithic. Where brick pavement is used this is employed for the entire surface, including next to the rail.

In the majority of heavy traffic streets recently paved with asphalt or wood block, stone block is used for the entire area between rails. In one wide thoroughfare,

however, the pavement between rails is wood block, while all the remainder is stone block. The reason for this is that, while heavy hauling and a considerable grade on the street seem to call for stone block, there is also a large amount of automobile travel over it, and since the heavy horse-drawn vehicles move slowly while the automobiles move rapidly, it is thought desirable to encourage the latter rather than the former to use the railway strip in order to minimize the delay to the trolley cars.

Although stone blocks make a dry crossing for pedestrians, the old style granite makes a rather rough one, and for such smooth crossings are desirable. In a number of places in Cincinnati crossings over rough stone block roadways are made of wood block laid in strips about 5 feet wide.

IN ROCHESTER.

In Rochester, N. Y., the cost of paving between and for two feet outside of the rails is charged by the city against the railway company. Within the tracks the city lays a concrete foundation 12 inches deep for the entire width of both tracks, in which standard street railway ties are bedded, spaced two feet from center to center, as a reinforcement. The difficulty of maintaining street railway traffic and at the same time placing the concrete under the ties, and the delays caused by keeping the cars off the new work a sufficient time to allow the concrete to thoroughly set, led to the adoption in many streets of broken stone ballast thoroughly tamped under the ties, in place of concrete. There has been laid in improved streets $3\frac{1}{2}$ miles of double track on such broken stone foundation, 2 miles on gravel and 44 miles of the concrete foundation. In addition $3\frac{1}{2}$ miles have been laid on "concrete beam" construction, consisting of beams of concrete under the rails, 12 inches deep, laid in connection with a 6-inch pavement foundation. The track is laid on iron ties made of old street railway rails bedded in the concrete, spaced 6 feet center to center.

During the three years covered by the latest report of the city, about 7 miles of T rails were laid, the grooves for the wheel flanges being formed by cutting Medina sandstone blocks to proper patterns and placing them on the gauge side of the rail in all Medina pavements. In brick pavements a shaped brick was used next to the rail to form the flange groove at first; but later stone blocks cut to uniform lengths for the flangeways were used instead.

All pavements between rails and for two feet outside were laid on a mortar cushion from one inch to $1\frac{1}{2}$ inches thick.

COLLOIDS IN ROAD CONSTRUCTION.

In a paper printed in the May number of the *Technology Monthly*, Clifford Richardson discusses the relation of colloids to and their effect upon the construction of bituminous roads and asphalt pavements and even water-bound macadam. A colloid is a state of matter, and any kind of matter can be brought into this state. He defines this state as one characterized by a very high degree of dispersion. If a solid, the main characteristic is a subdivision into particles not more than .0001 mm. in diameter and in some cases even .000,006 mm. As the surface area of even the largest of these is 100,000 times as great as that of a cube one cm. on a side which contains the same amount of matter, there is thereby developed great surface energy and capacity for selective adsorption.

In studying native bitumens, including petroleum, it is found that some of these form colloidal solutions while others (paraffine scale, for example) do not; he has found, for instance, that Trinidad asphalt contains a considerable amount of clay in the disperse solid colloid form. This offers a method of differentiating the native

bitumens or petroleums into two classes, and different oils can be characterized and differentiated by the relative amount of colloidal and diffusible matter which they contain. This characteristic can, Mr. Richardson believes, be developed into a means of differentiating the various bitumens which are used in pavement construction.

The presence of disperse solid colloid particles, with their great surface energy, adds greatly to the cementing or binding characteristic of a bitumen, he states; and he attributes the hard crust of a water-bound macadam to the formation of colloids by the action of water on the fine material, and the cementing of a sand-clay road to the colloids present in the clay.

PHILADELPHIA'S TEST ROAD

Three and a Half Miles of Bituminous, Both Mixing and Penetration Methods, Concrete with Bituminous Top and Brick—Present Conditions.

During the latter part of the year 1912 and 1913 the Philadelphia (Pa.) Bureau of Highways laid a "service test road" 3.4 miles long on the Byberry-Bensalem turnpike, 26 sections being constructed, using different materials and methods of construction. In his report for 1914 Wm. H. Connell, chief of the bureau, describes the condition of each of the sections at the end of that year. The sections are as follows:

| Section Located between number. stations. | Description of pavement. |
|--|--|
| 1 0+00 to 37+00 | Bituminous pavement, mixing method—"Amesite." |
| 2 37+00 to 47+00 | Bituminous pavement, mixing method—"Topeka specification." |
| 3 47+00 to 50+00 | Five-inch concrete with bituminous top. |
| 4 50+00 to 52+50 | Vitrified block on four-inch concrete base. |
| 5 52+50 to 59+50 | Five-inch concrete with bituminous top. |
| 6 59+50 to 72+00 | Bituminous pavement, mixing method—"Filbertine." |
| 7 72+00 to 84+50 | Bituminous pavement, mixing method. |
| 8 84+50 to 87+50 | Vitrified block on four-inch concrete base. |
| 9 87+50 to 94+00 | Five-inch concrete with bituminous top. |
| 10 94+00 to 97+00 | Vitrified block on four-inch concrete base. |
| 11 97+00 to 103+00 | Bituminous pavement, mixing method. |
| 12 103+00 to 109+00 | Bituminous pavement, mixing method. |
| 13 109+00 to 112+50 | Vitrified block on four-inch concrete base. |
| 14 112+50 to 118+00 | Five-inch Hassam concrete with bituminous top. |
| 15 118+00 to 121+00 | Vitrified block on four-inch concrete base. |
| 16 121+00 to 127+00 | Bituminous pavement, penetration method—"Ugite" binder. |
| 17 127+00 to 130+60 | Bituminous pavement, penetration method—"Byerlite" asphalt. |
| 18 130+60 to 133+00 | Vitrified block on four-inch concrete base. |
| 19 133+00 to 139+00 | Bituminous pavement, penetration method, "Tarvia X." |
| 20 139+00 to 145+00 | Bituminous pavement, penetration method, "Texaco." |
| 21 145+00 to 151+00 | Bituminous pavement, penetration method, Standard binder "B." |
| 22 151+00 to 157+00 | Bituminous pavement, penetration method, "Pioneer" road asphalt. |
| 23 157+00 to 163+00 | Bituminous pavement, penetration method, "Bermudez" asphalt. |

- 24 163+00 to 169+00 Bituminous pavement, penetration method, "Sun Hydrolene" asphalt.
 25 169+00 to 174+50 "Bicomac" concrete pavement.
 26 174+50 to 180+15 Vitrified block on four-inch concrete base.

An effort was made to interest the public in this test road. A bulletin board describing its construction was placed at each section, the first of which is shown herewith. This reads as follows:

"Section 1. Sta. 0+00 to 37+00. Bituminous pavement, mixing method, Amiesite.

Foundation Course.—The foundation course was originally old water-bound macadam with a telford base. After cleaning and spiking the old macadam, 1½-inch trap rock was spread and rolled to bring the surface to a grade two inches below the finished grade. Just enough screenings were added to form a coarse grainy base and the road was rolled and puddled until thoroughly cemented. A twelve-ton, three-wheel roller was used.

Surface course.—The paving mixture was shipped from the plant of the Amiesite Company and consisted of clean crushed trap rock passing a 1½-inch screen, treated with a liquifier and mixed with asphaltic cement, after which oxide of lime was added. The paving mixture consisted of the following proportions:

| | |
|-------------------------|--------------|
| Mineral aggregate | 92 per cent. |
| Asphalt | 5 per cent. |
| Lime | 1½ per cent. |
| Liquifier | 1½ per cent. |

The material was spread and rolled to a depth of two inches and after rolling once over, a final course of friable filler, consisting of a mineral aggregate of trap rock passing a ¾-inch ring and treated and mixed in the same proportion as above described, was then spread and rolled with a twelve-ton roller.

Surface finish.—Upon the wearing surface a thin layer of clean trap rock screenings was spread and rolled.

For further information apply to Chief, Bureau of Highways, City Hall, Philadelphia.

BRICK PAVEMENT.

Concerning the brick pavement sections, Nos. 4, 10, 13, 15, 18 and 26, the report is in each case: "This pavement is in good condition; no repairs have been required," while No. 8 is reported "in good condition with the exception of a slight longitudinal crack."

CONCRETE WITH BITUMINOUS TOP.

Sections Nos. 3, 5 and 9 were of 5-in. concrete covered with different materials. On section 3 Pioneer road surface asphalt was applied at the rate of one-half gallon per square yard and covered with chips. The base was mixed 1:3:6 and laid without expansion joints, and has developed a number of longitudinal and transverse cracks. The bituminous surface has disintegrated and peeled off. The renewal of the surface would cost about 12 cents per sq. yd.

Section 5 was treated in three different ways: 208 feet with Ugite "A," 1/6-gallon per sq. yd. applied by hand, then 3/8-gallon of Ugite No. 3 at 280° by pressure distributor, covered with ¾-in. trap rock chips; then ¼-gallon of the latter, covered with torpedo sand and rolled. Second, 259 feet with ¼-gallon of cold Tarvia "B," then ¾-

gallon of Tarvia "A" at 250°, covered with torpedo sand. Third, ½-gallon of Texaco asphalt cut back with naphtha, then 0.8-gallon of Texaco 55 penetration applied at 450°, covered with ¾-in. trap rock chips and rolled. (The first kind is in good condition; about 20% of the second has peeled off and practically all of the third.)

Two hundred and fifty feet of section 9 was covered with 0.4 gallon of Dolarway bitumen (generally in good condition). Seventy feet with ½-gallon of Bicomac, covered with a mixture of trap rock chips, trap rock dust and Bicomac and rolled; one-half then covered with trap rock dust and the rest with trap rock chips, slightly rolled. (Ninety per cent has peeled off.) On the next 65 feet, 0.4 gallon of asphalt cut back with naphtha was spread and the naphtha burned out, then trap rock chips spread and rolled. (Practically all has peeled off.) On the next 65 feet, ½-gallon of Bicomac, then 0.4-gallon of asphalt applied at 400° and covered with ¾-in. trap rock. (Entirely peeled off.) The remaining two hundred feet of concrete base was left uncovered. (Is in good condition, though slightly potted in a few places.)

On section 14 stone was spread and rolled with a 6-ton tandem roller to 5 inches thickness; then 1:2 cement grout mixed in a Hassam grout mixer was applied until it flushed to surface. Before this had set it was rolled again with same roller. Two and one-half inch trap was used for 235 ft., 1½-in. trap for 115 ft. and 1-in. to 2-in. crushed pebbles for 200 ft. A bituminous top of 0.25 gallon of Ugite No. 3 was applied at 250°, covered with ½-in. trap chips and rolled with 6-ton roller; then 0.25 gallon of asphaltic cement applied at 425° and covered with ½-in. trap chips. (No repairs required; in good condition.)

BITUMINOUS PAVEMENT, MIXING METHOD.

This was laid on 8,400 feet, in six different sections. Section 1 consisted of two inches of Amiesite laid as described above. (In good condition; a few waves; \$3 of repairs in two years.)

Section 2 was old macadam base covered with two inches of the following mixture:

| | |
|------------------------------|------------------------|
| Passing 200 mesh screen..... | 5 to 11 per cent. |
| Passing 40 mesh screen..... | 18 to 30 per cent. |
| Passing 10 mesh screen..... | 25 to 55 per cent. |
| Passing 4 mesh screen..... | 8 to 22 per cent. |
| Passing 2 mesh screen..... | less than 10 per cent. |
| Pioneer road asphalt..... | 10 per cent. |

(This section is in good condition, but waving slightly.)

Section 6, old macadam base covered with 2-in. of ¾-in. limestone, sand and Portland cement, mixed with asphaltic cement in proportions of 55 to 65% of stone, 35 to 45% of sand and cement, and asphaltic cement, penetration 6.6, to the extent of 70% of the aggregate. (In good condition; no repairs made.)

Section 7, old macadam base covered with 2-in. of 2 parts trap rock, run-of-crusher passing 1¼ in. screen, one part sand, 5% mineral dust and 5.2% asphaltic cement. (6.5% of asphalt was intended, but amount reduced by mistake.) Half of this received a seal coat of ¼-gallon of asphaltic cement at 350°, covered with ¾-in. trap rock chips and rolled. (In good condition; no repairs made.)

Section 11, old macadam base covered with 2 in. of trap rock, run-of-crusher passing 1-in. screen and retained on ¼-in., mixed with 4.8% asphaltic cement, then a seal coat of ¼-gallon of asphaltic cement applied at 350°, covered with ¾-in. trap rock chips and rolled. Repaired in spring of 1913 at cost of 2.3 cents per sq. yd., probably due to weather conditions during laying. (In good condition except a few small holes.)

Section 12, old macadam base covered with 2-in. of a mixture of bank gravel (none over 1 in., longest diameter) and sand with 8.1% of asphaltic cement; one-half received a seal coat of ¼-gallon of asphaltic cement and ¾-in. trap rock chips, the other half covered with sand. (In good condition; slightly wavy.)



INFORMATION BOARD,
SECTION 1.

BITUMINOUS PAVEMENT, PENETRATION METHOD.

These eight sections were all laid on the old macadam base, and all in the same way as section 16, except for differences stated. Section 16, 3 in. of $1\frac{1}{2}$ -in. trap rolled, 1.6 gallons of Ugite binder No. 3 applied by hand at 250° , covered with $\frac{3}{4}$ -in. trap chips and rolled; then seal coat of 0.6-gallon of Ugite No. 3 applied as before, covered with $\frac{1}{2}$ -in. trap chips and rolled. (In fair condition, but raveling in spots; 1 cent per sq. yd. of repairs made in 14 months.)

Section 17, 1.7-gallon of Byerlite applied at 400° , and 0.5-gallon of same for seal coat. (Raveled so badly it had to be rebuilt in 1914, when Tarvia "X" was used as binder.)

Section 19, 1.5-gallon of Tarvia "X" applied with pressure distributor at 230° , and 0.5-gallon of same for seal coat. Original pavement (laid in July, 1913) apparently burnt, and rebuilt in November, 1913. (In good condition, though more or less open.)

Section 20, 1.8-gallon of Texaco road asphalt binder applied by hand at 350° , and seal coat of 0.6-gallon of same. (Repairs have cost 0.5 cent per sq. yd.; now in fair condition, but slightly rough.)

Section 21, 1.5-gallon of Standard binder "B" applied by hand at 350° , and 0.5-gallon of same for seal coat. (No repairs made; in good condition except slight rut for 50 feet.)

Section 22, 1.7 gallons of Pioneer road asphalt No. 963 was applied by hand at 350° , and 0.5-gallon of same for seal coat. (In fair conditions, only slight wear on seal coat.)

Section 23, 1.8 gallons of Bermudez asphalt binder was applied by hand at 350° , and 0.6-gallon of same for seal coat. (No repairs made; in good condition; only slight wear on seal coat.)

Section 24, 1.7 gallons of Sun Hydrolene binder applied by hand at 350° , and 0.5-gallon of same for seal coat. (In good condition; slight wear on seal coat.)

On section 25 a concrete base proportioned 1:3:6 was laid 4-in. thick, and as soon as it had settled was rolled with a 700-pound hand roller, and while still wet and plastic was covered with a wearing surface one inch thick after compression; this surface consisting of 1 part Portland cement, 6 parts sand, 12 parts trap passing a $1\frac{1}{2}$ -in. screen and containing not more than 25% of $1\frac{1}{2}$ -in. stone, mixed with 8% of Headley Good Roads Co. No. 26 (Bicomac), the last used in the proportion of 70% Bicomac and 30% water. The stone was thoroughly coated with the solution, then the mixed sand and cement added, then the whole saturated with the solution and laid, and rolled with a 5-ton tandem roller. (In fair condition; a few transverse cracks and surface roughening. Repairs of 11.5 cents per sq. yd. made, probably due to fact that part of pavement was laid in freezing weather.)



INFORMATION BOARD ON PHILADELPHIA STREET.

MAKING PAVEMENT INFORMATION PUBLIC.

In the preceding article is described and illustrated the means employed by William H. Connell, chief of the Philadelphia Bureau of Highways, for giving to the passing public information concerning the construction of each section of a test highway. The same method has recently been employed by him in giving similar information concerning pavements on city streets.

The bureau is just completing the paving of Germantown avenue with improved granite block, and Chief Connell has placed at several points frames with glass fronts in which are set large poster cards explaining the construction in the following words:

Improved Type of
GRANITE BLOCK PAVEMENT.
On Six-Inch Concrete Base.
Germantown Avenue.

The Construction of This Pavement Presents:

The latest and best practice in granite block paving work. A type designed to withstand the extremely heavy traffic on this street.

A surface which will be smooth riding for automobiles and afford a good foothold for horses drawing heavy loads. Foundation Course:

The pavement is laid on a six (6) inch concrete base, mixed in the proportions of one part Portland cement, three parts sand and six parts stone.

Cushion Course:

Between the concrete foundation and the block surface there is a one-inch sand cushion.

Surface Course:

The improved granite blocks are from eight to twelve inches long, three and one-half to four and one-half inches wide, and from five to five and one-half inches deep, accurately dressed. The heads are so cut that they have no more than three-eighths of an inch depression from a straight edge laid in any direction across the head and held parallel to the general surface of the block. The joints are not more than one-half inch wide at the top and for a depth of one inch, and not more than one inch wide in any other part of the joint. They are filled with a grout of Portland cement and sand in the proportion of one part of cement to one part of sand.

For further information apply to
Chief Bureau of Highways and Street Cleaning,
Room 232, City Hall, Philadelphia.

PAN-AMERICAN ROAD CONGRESS.

For the past two years efforts have been made, especially by manufacturers of machinery and dealers in road materials, to have the American Road Builders' Association and the American Highway Association either hold one congress jointly each year or unite under one name. Both associations have now recognized the necessity for some concerted action, and as a result an agreement has been reached to hold a joint congress this year.

To carry out this plan, a joint committee has been appointed consisting of Major W. W. Crosby, former state highway engineer of Maryland, and E. L. Powers, publisher of "Good Roads," representing the American Road Builders' Association, and James H. MacDonald, former state highway commissioner of Connecticut, and J. E. Pennybacker, chief of Division of Economics, U. S. Office of Public Roads, to represent the American Highway Association. This committee was authorized to select a fifth member and chose Governor Charles W. Gates of Vermont, who was also elected chairman of the committee. This choice was especially appropriate, as Governor Gates had been state highway commissioner for ten years prior to his election as governor.

This executive committee has had several meetings and details connected with holding the congress are now being worked out. The congress will be held at Oakland, Cal., September 13-17. This will be the only congress held during 1915. Local committees have charge of all the arrangements on the Pacific Coast.

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CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

JUNE 3, 1915.

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Test Roads.

This week we describe briefly the paving materials used by Philadelphia in laying a test road about $3\frac{1}{2}$ miles long, and the present condition of each section. In our issue of May 6 we gave similar information concerning a test road in Minneapolis, and two or three other test roads in New York City and other parts of the country have previously been described by us. There is undoubtedly considerable to be learned by intelligent construction and careful observation of such test roads, but there is danger that non-technical citizens and even road officials may be misled into assuming that the lessons to be learned therefrom are more general than they really are. For instance, in any given road a test of several years will show (assuming that all materials have been laid and maintained with equal care and intelligence) which paving material is most durable and gives in general the best satisfaction *under the traffic and other conditions existing on that road*. That identical results would be obtained from the same materials under different conditions of traffic and of climate does not necessarily follow; while the local sands and stone or other aggregate

used in the construction may make considerable differences in the durability of the road.

To obtain the greatest possible information, those responsible for these test roads should not consider their labors finished with the construction of the road, but should carefully make and record frequent observations of the amount and kind of traffic passing over it, distinguishing between horse and automobile, between light and heavy, between broad and narrow tires and those of steel and rubber; and should have careful inspection made of the entire road at frequent intervals by an expert on road construction and maintenance, who should compare the conditions as found from time to time with the traffic records and those of the temperature and other weather conditions during the preceding interval.

When thus carefully watched and analyzed, the lessons to be learned from a test road are undoubtedly of the very greatest importance. But to simply build a road in a series of sections of different materials and then practically neglect it except for visits at intervals of six months or so, and conclude from such inspection that road A, because at the end of two years it is in better condition than road B, is therefore the better one for all highway work, is far from furnishing a reliable test and may do a great injustice to the discredited road.

There are probably some roads which have been put forward by inventors which are not to be recommended for any conditions. There may be one or two kinds of pavement which would prove satisfactory under all conditions (although we doubt whether this is the case if the cost be considered); but the majority of roads now before the public are capable of giving excellent service under some conditions but not so good service as others when under different conditions. The most important lessons which can be learned from test roads are, not which are the best materials, but under what conditions each of the several materials gives better satisfaction than any of the others.

Distrust of Official Advisers.

The majority of city engineers—we believe the very large majority—use their best endeavors to secure for the public a first-class performance of such work as comes under their charge. It also seems reasonable to assume that they know more about what is good public work than do the great majority of taxpayers. It does not, of course, follow that the city officials should not be watched carefully by the taxpayers, to see that they keep careful oversight of work done for the city; but in technical questions the engineer's opinion should certainly be given more weight than that of the citizens, or else he should be discharged and a non-technical man employed to carry out the decision of his non-technical employers.

In a good sized city in Ohio in the fall of 1913 a considerable stretch of creosoted wood block pavement was laid by contract. This street carries street railway tracks, and in order to accommodate traffic as much as possible one side of the street was completed before the other side was begun. The contract called for treating the blocks with 16 pounds of light-weight oil and laying with bituminous filler. Unfortunately, when sufficient blocks had been delivered for one-half of the street the company treating them found itself, through accident, unable to furnish additional blocks; but as the other half of the street had, in the meantime, been torn up, there was a demand that the remaining pavement be laid at once. The only blocks available were those having a heavier treatment with heavy oil, and the authorities decided to authorize the contractor to use these heavier blocks. Both the city engineer and the contractor stated,

as their opinion, that with the additional amount of heavy oil in the blocks it would be not only unnecessary, but undesirable to use any bituminous filler, and the contractor was accordingly instructed to use sand filler instead.

Hardly had the work with these blocks got well under way, however, before the property owners along that side of the street entered most vehement protest that they were being defrauded in that the contractor was not using bituminous filler, according to the specifications. Although the city engineer endeavored to explain to these suspicious citizens that it was really for their benefit and to prevent the unpleasantness of a bleeding pavement that the filler was omitted, they insisted that it was simply a case of graft for the benefit of the contractor and demanded that the filler be used. With a final warning to the citizens of the result, their demand was complied with, and the same amount of filler was used as required by the contract for the light-treatment blocks.

Throughout the summer of 1914 the street force was employed at intervals in hoeing off the surplus bituminous ooze on that side of the street, which was in a very unpleasant condition throughout the warm weather, while the other side was not. With the first warm days of the present spring, this side of the pavement again began to bleed and when visited by us a few weeks ago the first thing noticed in glancing at the street was the difference in appearance between the two sides, one of which showed practically no bleeding whatever, while the other side was black with the exuding material.

This instance may or may not be a demonstration of the desirability of using lighter oil; but it would seem to be an illustration of the intolerable nuisance which may be created by using bituminous filler combined with 20-pound treatment with heavy oil; in addition to furnishing a confirmation of the ideas stated in the first paragraph.

ABSORPTION TEST FOR WOOD BLOCKS

As Employed in New York, Where Expansion Joints Are Not Used, As a Test for Sufficiency of Treatment.

When municipal engineers were considering the advisability of laying treated wood block pavements some twelve or fourteen years ago, it was uncertain as to just what should be the requirements of the specifications. It was well known, from previous experience, that the blocks should be treated, but just what the nature of the preservative should be and how much should be used were not well known.

At that time it was proposed to treat the blocks with what was known as the creo-resinate process, that is, the preservative should be composed of one part of creosote oil and one part of resin. The theory of the resin in the preservative was that the creosote oil, being a volatile substance, would naturally lose its value under climatic conditions, but that the resin would keep it in the blocks so that its preservative properties would be more enduring. It was felt that it was necessary to prevent the blocks from decaying and also so treat them that they should not absorb so much water as to swell and cause the pavement to bulge during a wet spell, nor should they shrink too much in dry, hot weather, so that they would become loose. Twenty pounds of preservative was decided upon but just how to be sure that the blocks were treated with this amount was a question, it not being deemed practicable to have inspection at the plant. It

was finally decided that, knowing the weight of long leaf yellow pine (the wood that was to be used) to be about 42 pounds per cubic foot, if the blocks would sink in water they had been sufficiently treated, and that requirement was specified.

The test for expansion was not so easy. After careful consideration, however, it was decided to require an absorption test of the blocks. This test provided that, after having been dried in a kiln at a temperature of 100 deg. F. for 24 hours and then immersed in water for an additional 24 hours, the blocks should not gain in weight more than 3 per cent during immersion. Pavements were laid under this specification in 1903 and 1904; on one street with a preservative that did not contain any resin, but was a specially prepared oil. All these blocks conformed to the requirements as to weight and absorption. These pavements have been in use 10 and 11 years, without any expansion joint, and have required almost no attention on account of the instability of the blocks.

In certain cases where pavements were laid not under the supervision of the city and the absorption test was not applied, the pavements did expand to a very considerable extent. The writer knows one instance where blocks were laid that were supposed to conform to the absorption test but did not, and had been condemned, and these blocks expanded materially and had to be taken up and replaced.

The city of New York is the only municipality of which the writer knows where the absorption test is required, and it is also the only city, in his knowledge, where an expansion joint is not used. Some five or six years ago the specifications were changed so that an oil having a specific gravity of 1.10 to 1.12 was used without any resin. The absorption test was retained, however, but the percentage increased to 3½ for long leaf yellow pine. No trouble has occurred on account of bulging, even where expansion joints were not used.

The writer firmly believes that with a heavy oil treatment and a specification requiring an absorption test, as given above, satisfactory results can be obtained without an expansion joint.

Some believe that if a less amount of oil is used there will be less bleeding of the pavement, although by the use of an expansion joint practically the same results can be obtained. Whether the reduction of 3 or 4 pounds of preservative per cubic foot will materially reduce the bleeding of the pavement when first laid is uncertain, so far as present experience goes.

It is not desirable to use expansion joints crosswise of the street, and if the use of an expansion joint along the curb is relied upon to take up an excessive expansion of the pavement due to a light treatment and consequently great absorption, it is possible that bulging will occur lengthwise of the street when it would not crosswise.

The Borough of Manhattan, New York City, in the 1914 specifications, has decreased the amount of treatment from 20 pounds to 18 pounds and has permitted an absorption of 5 per cent with no expansion joint; a bituminous joint filler is used, however. Just how pavements laid under these specifications will work out in practice has of course not been determined at the present time. But assuming that an expansion joint along the curb will take care of all thrust in any direction on account of expansion, with a less treatment than 20 pounds per cubic foot and a 5 or 6 per cent absorption (although this is not admitted by the writer), the engineering question would remain whether it would be desirable to have the lesser treatment with the expansion joint rather than the greater treatment without it. As the great majority of the wood pavements of this country of long leaf yellow pine are more apt to fail through some other agency

*Paper before American Association for the Advancement of Science by Geo. W. Tillson, Consulting Engineer, Office of the President, Borough of Brooklyn, N. Y. City.

than that of traffic, the writer feels that a little extra expense towards the treating of the blocks will be justified in the long run. He realizes, of course, that where the traffic is heavy or moderately heavy, so that the blocks are liable to wear out in a reasonable length of time, as much of the preservative per cubic foot is not required as upon light traffic streets.

He feels, therefore, that, from the experience of Brooklyn particularly, a stringent absorption test is of great value and that the expense incurred to make the blocks meet it is justified. He appreciates fully the inconvenience of making the absorption test, also the expense the contractors are liable to be put to if the blocks, after being delivered on the street, do not meet this requirement. The test, however, may be made at the plant where the blocks are treated, and if so made by an authorized inspector of the municipality and the blocks used soon after, he believes that this trouble would to a great extent be obviated.

SAND CUSHION VS. MORTAR BED FOR WOOD BLOCK PAVEMENTS*

Objections of Former and Advantages of Latter—Specifications for Laying Wood Blocks on Bed of Dry Mortar.

In this country it has been the custom for many years to lay wood block pavement on a concrete base with a cushion of sand or a bed of mortar between the base and the blocks. At present in European cities the concrete is laid perfectly smooth and the blocks are placed directly thereon, though 15 years ago a mortar bed was used in London. In order that the reasons for the American practice may be discussed with understanding, the specifications as used in the Borough of Richmond, City of New York, follow.

On the surface of the concrete shall be placed a bed of [sand] dry mortar, composed of one (1) part of cement to four (4) parts of sand, one-half ($\frac{1}{2}$) inch thick.

On the surface of the mortar bed shall be set strips of wood three inches wide by one-quarter ($\frac{1}{4}$) inch thick, or strips of steel of the same width by not less than one-eighth ($\frac{1}{8}$) inch thick, and of the greatest length convenient for handling. These strips shall be carefully set parallel and about eight or ten feet apart, running from curb to curb, and be imbedded in mortar throughout their lengths, so that the top surface shall be the required depth below and parallel to the grade of the finished pavement. The space between two strips having been filled with mortar, a true and even top surface shall be struck by using an iron-shod straight-edge on the strips as a guide, and as soon as the bed has been struck, the strips which would interfere with laying the blocks shall be removed and their places carefully filled with mortar.

On this mortar surface, spread and smoothed as above to the proper crown and grade, the blocks are to be laid with the grain up, with close joints, and uniform top surface, in courses at right angles to the line of the street, except in and between car tracks, in intersections and in other special cases, when they shall be laid diagonally, as shall be directed.

When laid, the blocks shall be covered with clean, fine sand, entirely free from loam or earthy matter, perfectly dry and screened through a sieve having not less than twenty (20) meshes per linear inch, the sand to be swept and brushed into the joints. The pavement shall then be rolled with a four or five-ton roller, and sand spread over the pavement and left on the surface until such time, when, if required by the engineer, the pavement shall be swept clean for final inspection, and any defects then noted shall be remedied.

It would seem from the foregoing that a sand cushion was intended primarily to smooth out the roughness

and inequalities in the concrete, so that the blocks might rest evenly thereon. Secondly, the yielding surface of the sand permits the roller to press the blocks into it until they present a smooth surface adjusting the slight inequalities in the depth of the blocks, and thirdly, the sand has a slight resiliency and protects the blocks somewhat from surface wear. The mortar bed performs the same office as the sand as an equalizer of the concrete surface and the surface of the finished pavement, but there the similarity ceases, for, as the mortar gradually sets it forms a hard unyielding bed for the blocks to rest upon, sacrificing resiliency for immobility.

There are two objections in the writer's opinion to the use of a sand cushion. First, when cuts are made for any purpose through the pavement, it frequently happens that weeks and months elapse before repairs are made; during this time, storm water works its way between the blocks and base and disturbs considerable quantities of pavement that will have to be relaid. This is especially noticeable on streets with a considerable grade, and could not occur with a well set mortar bed. Second, it would seem that even the slight resiliency of the sand cushion would mean the unstable condition of each block with respect to its neighbors, and a consequent lack of support on sides and ends which is of the utmost importance.

The one objection to a mortar bed has always been that the mortar has been mixed damp and time must be allowed for it to set hard (three or four days), before traffic could be admitted, whereas wood block pavement on sand cushion can be thrown open for traffic as soon as completed. The writer has overcome this objection by mixing the mortar dry, and allowing it to set as moisture reaches it through the joints, which are always of sand. The roller and immediate traffic work the blocks down to their final beds before the mortar sets. Work of this kind has been examined at plumbing cuts and it has been found that the mortar was set up hard, though traffic had been allowed on the new pavement as soon as completed, and the surface was still uniform.

The fact of the lack of use of sand or mortar cushion in the practice of European countries would appear to indicate their opinion that a firm and unyielding bed for the blocks was the main consideration, relying entirely on the fiber of the wood for resiliency.

Asphalt blocks have for many years been laid on a mortar bed and this method has evidently been adapted for use in laying wood block pavement. Some six years ago the writer used a damp mortar bed for a wood block paving contract. One day the roller broke down at a time when a large yardage of block had been laid and was ready for rolling. Before the roller was repaired the mortar had set and the pavement on this section was never as perfect as on those adjoining. For this reason a sand cushion was substituted for a mortar bed in the specifications until last year, when dry mortar was permanently adopted. In the writer's opinion mortar is superior to sand for a bed for wood block pavement.

EXPERIMENTS WITH WOOD PAVING BLOCKS.

Our attention has been called to the fact that in an article which appeared under the above title in our issue of May 6 there were two slight errors in the column headings of tables 2 and 3. In table 2, under each of the two columns which are bracketed together, there should have been over the left-hand column of each pair the heading, "Square feet." In table 3 the heading of the next to the last column, "Area of local depressions below general level of section," should have covered the last column as well.

*Paper before American Association for the Advancement of Science by Theodor S. Oxholm, engineer in charge Bureau of Engineering, Richmond Borough, New York City.

The WEEK'S NEWS

Pennsylvania's Good Roads' Day and Road Legislation—Dixie Highway Split—Draining the Mosquito Meadows—Typhoid in Johnstown, Pa., Newburgh, N. Y., and Sabillasville, Md.—Wisconsin Water Power Bill—Richmond, Ind., and Its Gas Plant—New Auto Apparatus—Denver's Election—Pennsylvania Legislation—Ohio Legislation—Clean-Up in Williamsport and Philadelphia—Jitney Regulation—New Municipal Piers at Philadelphia, Trenton and Jacksonville.

ROADS AND PAVEMENTS

Pennsylvania's Good Roads Day a Success.

Harrisburg, Pa.—The State Highway Department was kept busy receiving reports of the splendid good roads work that came in from all over the state. The success of the day was undoubted. Owing to the rain in many parts of the state the number of men who would have turned out was reduced by about half. In the northeastern part of the state the rain began before daylight and continued without cessation until after dark, so that in several of the counties, particularly Pike and Monroe, no effort was made to do work on the highways. In the central and southeastern sections morning rain and threatening weather all day deterred many from going out. West of the Allegheny Mountains conditions were better and a large number worked the roads. Statistician W. R. D. Hall, of the State Highway Department, finds that a total of 41,000 men worked on 3,900 miles of roads and 8,800 teams and 1,200 drags were used, reports from 15 counties not being received in time for inclusion in these figures.

Motor Tax Bill Vetoed.

Albany, N. Y.—Governor Whitman has vetoed Senator Hewett's bill to tax the horsepower of commercial motor vehicles and assessing jitneys \$2 a year for each passenger seat and motorcycles \$2 a year. The bill was drafted to bring a revenue of \$200,000 a year. In vetoing it, the governor said that it would destroy the system of the re-registration of motor vehicles throughout the state of New York. Its approval in its present form, in his judgment, would lead to serious confusion and might result in a very great financial loss to the state of the revenue which the state now receives under the existing law, providing for the re-registration of motor vehicles.

Two Routes for Dixie Highway.

Chattanooga, Tenn.—The Dixie Highway Commissioners have decided to establish the route of the lakes to gulf road through both Louisville and Cincinnati. In order to accomplish this they will designate a west Dixie highway and an east Dixie highway between Chattanooga and Indianapolis. The northern terminus of the highway is placed at Chicago, the east and west routes being joined at Indianapolis. Louisville is placed on the west route, while Cincinnati will be on the east route. The west route to Chicago extends from Chattanooga to Nashville, Louisville, Paoli, Bloomington, Bedford, Martinsville, Indianapolis, Crawfordsville, Danville, Ill., and Chicago Heights, and the east route runs from Chattanooga to Knoxville, Cumberland Gap, Lexington, Cincinnati, Dayton, Richmond and Indianapolis. The proposition of selecting an east and west highway, which the commission explained will be of equal importance and standing, was proposed by Commissioner W. T. Anderson, of Georgia, and seconded by Commissioners Thomas Taggart, of Indiana, and George G. Harris, of Ohio. The links in the highway from Chattanooga to Macon, Ga., were selected as follows: Chattanooga to Atlanta—West route, through Lafayette and Rome. East route through Dalton and Calhoun, the roads joining at Cartersville. Atlanta to Macon—West route through Griffin and Barnesville. East route, through McDonough and Jackson. The section of the west Dixie highway south of Macon was designated through Albany, Thomasville, Tallahassee, Lake City and Jacksonville to Miami. Selection of the east route, Macon to Jacksonville, was deferred, and the two Georgia commissioners were instructed to investigate the various competing roads and submit a recommendation within ninety days. Before adjournment

of the executive session the association adopted a charter, perfected a permanent organization of twenty-one directors, comprising the fourteen commissioners and the seven original incorporators, and made plans for constructing the highway. A resolution which was adopted provided that the various links in the road must be completed within a year and it was proposed that the highway be dedicated next November, probably on Thanksgiving day. A resolution was adopted notifying each county and municipality through which the highway has been designated, that their links must be completely and satisfactorily constructed in accordance with the association specifications, within a year from May 22. The association reserved the right to change the location of any part of the highway if the county or city fails to meet requirements. Another resolution, presented by Commissioner George W. Harris, of Cincinnati, recommended to the directors the construction of branch roads connecting with the main highway be encouraged. It also recommended that each state not now represented and which builds acceptably later shall be permitted to name two directors of the association.

Pennsylvania Road Bill Passed.

Harrisburg, Pa.—The resolution proposing a constitutional amendment to permit the State to issue \$50,000,000 bonds for improvement of highways has been passed in the house by a vote of 160 to 24. It has already passed the senate. This resolution must be passed by the next legislature to enable it to be laid before the voters. In the event of passage by the general assembly of 1917 the voters would have it before them in November, 1918, as the last road loan amendment was voted in 1913, and five years must intervene. The details of the bill have already been described in these pages.

SEWERAGE AND SANITATION

Draining New Jersey Mosquito Meadows.

Newark, N. J.—A 12-inch rotary pump and a 15-horse-power electric motor in a little corrugated iron shack out in the meadows in Hudson county will determine to a large extent, the engineers say, how many mosquitoes there will be this summer in the northern end of the city and in the municipalities to the north and west. Being installed by the Hudson county mosquito extermination commission, this pumping outfit is expected to be the first of a series of similar plants to drain the entire meadow area in Hudson, where millions of mosquitoes are bred every year. All of the plan for meadow improvement was laid down by Dr. J. T. Headlee, state entomologist, in consultation with James E. Brooks, consulting engineer for the mosquito extermination commissions of Union and Hudson counties. William Delaney, superintendent of the Hudson county commission, is carrying the scheme through. The vast area of meadow lies a foot below mean sea level. For that reason the ordinary ditching had little effect, it was found. At low tide there was a flow, but at high tide the water spread out over the meadows and created a swamp. To overcome this situation, the whole area was surrounded by a dike. But still there was a place for the tide to get through, and that was Frank creek, an open sewer dug from Kearny through the meadows and into Newark bay. Oiling helped to a certain extent, but this was not deemed sufficient. Dr. Headlee devised the scheme of ditching to a common centre and pumping the water from there to Frank creek and thus out to sea. Last summer a small shack was erected; a pump and gasoline engine were installed and this cleared approximately 1,000 acres. The

results obtained here were deemed sufficient to warrant the county going into the plan on a more elaborate scale. The new shack now completed is the first of the new plants. Instead of the gasoline engine, power will come from the Turnpike wires of the Public Service, a half mile away. The pump will run 24 hours a day when necessary and will drain a large area. To this pumping station laborers are hard at work digging a network of ditches with spades worked by two men that take up a wheelbarrowful of muck at a time. From a marsh where it is dangerous to step the whole meadow district will soon become hard and fertile land. The engineers say there would have to be a lot of filling before the land could be used for commercial purposes. The illustrations show ditching and the pumping station.

Sanitary Survey Begun.

Dallas, Tex.—Charles Saville, director of sanitation, and the inspector of the sanitation department, have begun a sanitary survey of the city. Mr. Saville will prepare maps of the city sewer mains and laterals. The maps will also show all dry closets, unsanitary water holes and dumping grounds. Mr. Saville has had his attention called to several nuisances that are very dangerous to public health, and these will be dealt with at once. The sanitation campaign will be vigorous throughout the summer. W. E. Beilhartz has been appointed by City Engineer Hal Moseley to make a sanitary sewer map and also a map of water mains of the city.

Typhoid Under Control.

Johnstown, Pa.—Although Lincoln S. Imler, special sanitary inspector of the state health department, decided to come here to investigate conditions, the city health authorities feel that they have the typhoid fever situation well in hand. The result of tests made by City Bacteriologist F. M. B. Schramm shows that while much of the drinking water in the Walnut Grove section is not of the best, the water in another section, the one where all the cases were located, are polluted. Dr. Samuel G. Dixon, at Harrisburg, is being kept informed of the situation.

City-wide Vaccination.

New Rochelle, N. Y.—Every man, woman and child in New Rochelle who has not been vaccinated within three years and who does not object was vaccinated at the city's expense. Health Officer Dr. Edwin H. Codding with the co-operation of Mayor Edward S. Griffing and the city administration, have determined to safeguard the city against a small-pox epidemic. Those who object could not be forced to submit, for when the compulsory vaccination law was passed it was changed to be effective only in cities of the first and second class. Most of the city's employees were vaccinated.

Try to Check Typhoid Spread.

Newburgh, N. Y.—Drastic measures to check the epidemic of typhoid fever in the city were taken by the Board of Health at the request of Dr. T. J. Burke, the health offi-

cer. Proprietors of four dairies were ordered to discontinue sending milk into Newburgh, and one local dealer was also shut off. Nine cases of typhoid were reported in a few days. With one exception all the cases were confined to a comparatively small district embracing the section. Investigation showed that most of the families of the persons affected take milk from the dealers stopped.

Typhoid Outbreak at Sanatorium.

Baltimore, Md.—With 13 cases already reported to the state board of health, a typhoid fever epidemic threatens the patients of the state sanatorium at Sabillasville. Dr. C. W. G. Rohrer, assistant secretary to the state board of health, has gone to Sabillasville to investigate the outbreak of the disease and make an effort to curb its progress. Although details of the epidemic are lacking, Dr. John S. Fulton, secretary of the board of health, announces that it is probable that most of the cases will be confined to the sanatorium. The cases will probably be isolated or sent to Baltimore hospitals.

WATER SUPPLY

Borough Must Instal Filter System.

Morrisville, Pa.—According to a decree issued by the Pennsylvania State Board of Health, Morrisville Borough will be compelled to have erected a modern filtration plant to purify its water, which is used from the Delaware River, considered badly contaminated. It is said a filtration plant will cost about \$15,000, and according to the decree there is no alternative for the borough officials to do but to proceed to get estimates, have drawings made and go ahead with the work. The decree also states that the borough has been violating the state laws ever since 1905 in the laying of water mains without a permit from the state, but it continues that the state department will temporarily withhold action on these violations pending the borough's action on the present orders.

Vote to Buy Plant.

Wildwood, N. J.—By a vote of nearly four to one, Wildwood residents decided in favor of the city purchasing the Wildwood water works. The price set by an arbitration board is \$554,000 and a bond issue to cover the purchase will be floated at once, with an additional \$20,000 to construct fire mains and new wells.

High Water Consumption in Tacoma.

Tacoma, Wash.—No other city in the country is as wasteful of its water and no other city uses as much water per capita as does Tacoma, according to a report made to Public Works Commissioner Woods by the water department. As a result a meter system may have to be adopted and rates made so low on the normal supply that patrons of the municipal plant will apply to have a meter installed. The cost of installing meters throughout the city would



Courtesy, Newark (N. J.) Evening News.

FIGHTING THE MOSQUITO.

be approximately \$250,000, it is estimated, but the proposal now being considered by officials is to place them gradually as the profits of the plant will allow. The report shows that during last summer Tacoma citizens were using an amount of water equal to 425 gallons per capita a day. Water department engineers have reported that the leak from the Alaska reservoir would fill a three-inch pipe and it is running continuously. The concrete is about half as thick as it should be, the engineers say, and as a result the seepage has washed away a large amount of the earth beneath the huge basin, leaving it in a dangerous condition.

St. Louis' Filter Plant.

St. Louis, Mo.—The accompanying illustration gives a view of the new filter plant for the St. Louis water supply, the opening of which was recently described in these pages.

STREET LIGHTING AND POWER

Wisconsin Waterpower Bill Passed.

Madison, Wis.—The waterpower bill known as substitute No. 3-S, offered by Senator Ackley through the special conservation committee, and which represents the views of the waterpower owners of the state, was passed by a vote of 16 to 14. Those who helped Senator Paul O. Husting enact the present law two years ago, supported the Bosshard substitute No. 4 this year, a bill which amends the Husting law in two principal particulars only, those relating to compensation for powers taken over by the state and to elimination of the repeal clause from the present law. This substitute was rejected by a vote of 17 to 13.

City May Have to Buy Rival Plant.

Richmond, Ind.—The controversy between the city of Richmond and the Richmond Light, Heat and Power company in regard to the proposed purchase of the electric lighting and power plant of the latter by the city in order to give the city's plant a monopoly of the business, has developed a new angle. It became known that the city in making a proposal to buy the plant of its competitors, had virtually entered into a contract to buy at a price to be fixed by the state public service commission when the appraisal has been made. It is asserted that under the provisions of the Indiana statutes the city of Richmond automatically obtained an option on the plant of its competitor in 1913, when the Richmond Light, Heat and Power Company surrendered its franchise and agreed to operate its business under an indeterminate permit. It also is asserted that a month ago when the council by unanimous vote agreed to buy the plant of the Richmond Light, Heat and Power Company, the contract for such purchase was automatically made and nothing now remains but for the state commission to fix the price. City officers were surprised when it became known that such was the case, as they had been of the opinion that thus far the city had simply performed the necessary preliminaries to bring about a purchase if it saw fit. Officers of the Richmond Light, Heat and Power Company, it is said, have agreed to release the city from its obligations, if it is so desired, provided the city will lease its plant to the Richmond Light,

Heat and Power Company. This would mean, city officers say, that the private corporation would be able to dictate terms as to a lease of the city property, the only alternative of the city being to buy, even though the price fixed by the appraisal would be so high that it would virtually bankrupt the city. Some of the city officers declare they do not believe the city can thus be hemmed in by proceedings which were undertaken with the idea in view that the purchase of the private corporation's plant would be made if the price were acceptable. Incidentally it has been discovered that the private plant is losing money.

To Bury Wires in Camden.

Camden, N. J.—Many miles of overhead wires in Camden are to be buried as soon as possible by the Public Service Corporation, an agreement having been entered into with the street committee of city councils to that effect. In the original agreement, adopted after considerable modifications and several conferences, the corporation planned to lay out \$25,000 a year for this work, but it will cost much more now. The first section of the work has been completed. Mayor Ellis and other officials of the city have been seeking the elimination of these overhead wires for several years.

MOTOR VEHICLES

New Municipal Garage.

New York, N. Y.—A double celebration of the opening of the new Manhattan municipal garage and the first anniversary of the opening of the Manhattan municipal asphalt plant drew an interested crowd at the invitation of Borough President Marks.

A New Service Car.

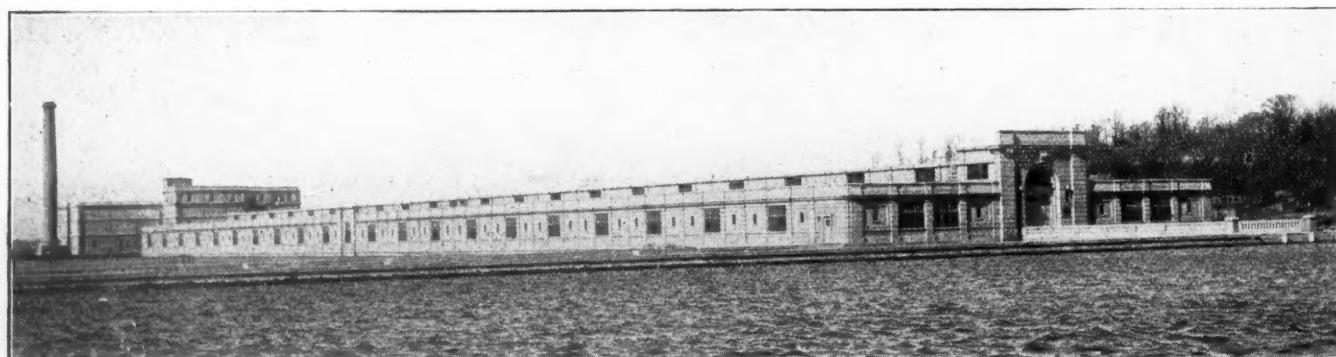
Butte, Mont.—The new service car for the fire department has been turned over to the city and tried out by Mayor Charles H. Lane. Behind the front seats of the machine is the 30-gallon chemical tank, equipped with the necessary connections and hose.

Engine Motorized.

Harrisburg, Pa.—The Hope fire engine which has been at Hoboken, N. J., to be equipped with a front motor drive, has been received. It was tried out by Chief Kindler on hill streets and found to make twenty miles an hour on the grades. The Friendship engine, which was badly damaged in a collision several months ago, is still at the factory. The next piece of apparatus to be equipped with a tractor will be the large hook and ladder truck of the Mt. Vernon company.

Saving by Auto Trucks.

Delaware, O.—According to a report made before the city council by Fire Chief Keiser, the city has saved \$1,456.95 in the past year by the use of auto trucks for fire fighting. The expense incurred by the department from July 1, 1912, to July 1, 1913, while using horses, was \$1,150. The expense in the year July 1, 1913, to July 1, 1914, when auto trucks were in use, was \$300 plus \$23.05 for gasoline,



Courtesy, St. Louis (Mo.) Star.

NEW ST. LOUIS FILTER PLANT.

making it altogether \$323.05. This shows a saving of \$826.95 in favor of the auto trucks. One less man was necessary to operate the equipment now used and his wages saved gave a total of \$1,456.95.

GOVERNMENT AND FINANCE

No Public Service or Municipal Bureau for Pennsylvania.

Harrisburg, Pa.—The house defeated the bill to abolish the public service commission and to create in its place a public service bureau of the department of internal affairs. The bill to create a division of municipal statistics and information in the department of labor and industry was also defeated in the house.

Denver Election Results.

Denver, Colo.—The city has gone on record by a great majority against the adoption of the single tax proposal. The amendment permitting the council to make reductions in levies authorized by the people when the necessity for them no longer exists was adopted. The Moffat tunnel commission no longer exists but the utilities commission, in charge of providing a new water supply, has been sustained and will continue in office. The proposal for a separate election commission was adopted. The double platoon fire department plan was defeated. Altogether four of the ten proposed charter amendments were approved and five proposed bond issues defeated.

Cannot Decide on Bill Relieving Ohio Cities.

Columbus, O.—After passing the Jackson bill by a vote of 17 to 16, the senate reconsidered it, by request of Governor Willis, it is said, and defeated it. The measure was designed to relieve the larger cities of the state from their present financial embarrassment and to keep them from extravagant financing in the future. A fight on the bill is expected.

Consolidate Departments.

Birmingham, Ala.—Consolidation of the offices of building inspector, plumbing inspector and city engineer has been decided upon by the board of city commissioners. Julian Kendrick, at present city engineer, will be in direct charge of the combined departments. Mr. Kendrick will have assistants or chief clerks who will be in active charge of both departments, but he will be in direct supervision of and responsible for their conduct of official affairs.

To Carry on Public Utilities Appraisals.

Columbus, O.—Members of the public utilities commission announce that they will be able to carry on satisfactorily physical valuations on the appropriation provided for in the long budget. The bill introduced in the house provides a total of \$101,995 to carry on the work of making physical valuations of public utilities, in comparison with last year's appropriation of \$50,000. The allowance provides for the employment of 30 appraisal engineers, and \$25,000 for extra help for the purpose of carrying into effect immediately the valuation of utilities now provided for. Last year 26 appraisal engineers were employed. In the short term budget this year 9 of the appraisal engineers were cut out.

Legislation for Philadelphia.

Philadelphia, Pa.—The house at Harrisburg has passed a bill backed by Senator McNichol amending the charter of Philadelphia by striking out the clause which stipulates that bids for contracts for city work shall not be received when those bids are larger than the estimates made by the city engineers. Director Cooke of the Department of Public Works objected to the bill. It was passed by a vote of 191 to 0. The joint resolution, calling for an amendment to the state constitution to increase the borrowing capacity of Philadelphia from seven to ten per cent., and permitting the use of funds thus raised for general municipal purposes, passed the house. It had previously passed the senate.

The bill providing that in Philadelphia the assessment of real estate for taxation, the machinery and tools used in manufacturing in any mill or manufactory shall not be considered or included in determining the value of real estate was also passed.

STREET CLEANING AND REFUSE DISPOSAL

Successful Clean-Up Campaigns.

Williamsport, Pa.—Councilman James A. L. Minor, superintendent of public improvements, has announced that 298 loads of refuse matter were hauled to the city dumping grounds during the annual spring clean-up, which recently closed. This year the boxes of the wagons were made somewhat larger and this accounts for the fact that not so many loads were hauled this year as in 1914. The cost of the work was \$424.75, nearly \$100 less than what it cost last year.

Philadelphia, Pa.—Chief Connell, of the bureau of highways, reported that before the end of the "Clean-Up Week" 7,500 extra loads of rubbish and debris, an average of 1,500 per day, had been removed. This is 1,500 loads more than were carried away in the same period of 1914. Dirt and small trash had been put out in such abundance that, despite the fact that it was more readily handled than the larger pieces that crowded the sidewalks last year, there were used on the average 20 per cent more teams daily than on any day of the corresponding period in 1914.

Work on New Crematory.

Wilmington, Del.—Workmen hastened operations on the new city crematory, which was ready by June 1, when the American Reduction Works, of Camden, N. J., which recently received a nine-year contract for the disposal of garbage in Wilmington, commenced operations. The new building will cost \$6,000 and it is planned to place machinery in it valued at \$14,000. The American Reduction Works, which is a Delaware corporation, received the contract from the board of health about a month ago, when bids were received from a number of disposal firms. The American Reduction Works offered for \$27,600 to erect a plant and dispose of the garbage for nine years. In addition, it would erect an incinerator where all store and industrial plant refuse would be consumed. At present this refuse matter is deposited on the various dump lands about the city. In addition, the city is to receive 10 per cent of the net profits of the American Reduction Works each year, and at the end of the contract the plant will be turned over to the city without any cost. Under the terms under which the garbage is now being disposed it cost the city close to \$36,000 for the past nine years. Under the old contract the city at the end of its contract named two appraisers, the Wilmington Sanitary Company, which had the contract, was allowed two appraisers, and these four selected the fifth, all of whom viewed the crematory. They placed a value of \$25,000 on the plant. This price was thought excessive by the board of health and a new contract was entered into with the American Reduction Works.

RAPID TRANSIT

No Massachusetts Jitney Regulation.

Boston, Mass.—By a voice vote, the house of representatives killed the much-discussed "Jitney-bus bill" and its amendments.

No Jitney Legislation for Pennsylvania.

Harrisburg, Pa.—The E. W. Patton bill, regulating jitneys, has been dropped from the house calendar. Senator Patton said he did not care as it was amended so that it was of little value.

Jitneys Out of Business.

Little Rock, Ark.—Drivers of forty jitneys and operators of five taxicab lines in Little Rock, constituting practically the sole motor transportation of this city, have suspended as the result of an order of the chief of police requiring that all operators not under bonds of \$2,000 for each car in conformance with a recent ordinance, be arrested.

MISCELLANEOUS

Municipal Piers.

Philadelphia, Pa.—Work on the two big municipal piers being constructed on the Delaware river is being pushed rapidly toward completion, and it is believed that the structure will be turned over to the city by August 15. Three hundred men are at present engaged upon the million-dollar operation. The progress of the contract was halted for a short time when an unexpected drop in the river bed necessitated the ordering of longer piles than had been planned. At the present time the two double-decked piers are bare skeletons of steel framework. Portions of the concrete work remain to be laid. Each pier will be 550 feet long and 180 feet wide. The piers will house about 60,000 tons of freight.

Trenton, N. J.—Men prominent in the deeper waterways and port development projects, from this city and other points along the Delaware river, participated in the ceremonies in which Mayor Donnelly, of Trenton, shoveled out the first spadeful of dirt in the excavations for a modern pier at the lower end of that city. Trenton is making its bid for a greater water-borne commerce by providing practical means for taking care of a greater bulk of that trade. Incidentally, the construction of that wharf means the necessary deepening of a channel that is supposed to be 14 feet deep, to make it of sufficient depth to accommodate, without danger, the steamers that will make use of it; and the work of channel deepening and pier construction will be coincident. Seventy thousand cubic yards of excavation will be necessary for the pier alone. For the development of the river front, Trenton has appropriated \$100,000. For the construction of the municipal dock \$50,000 has been appropriated. The fill from the dock excavations will be used to bring the lowlands up to the proper level. Work on the dock itself will be pushed to hasty completion. It will accommodate boats of sufficient draft to care for the needs of the city in freight and passenger service. Aside from the dock itself, there will be a large turning basin. The dock will also serve the purpose of a recreation pier. There will be rooms for the holding of meetings winter and summer, and the building, of steel construction, will be modern in every particular, containing comfort stations and retiring rooms, etc.

Jacksonville, Fla.—According to the report of the engineer of the port board, 624,563 cubic yards of material have been handled by the Home Dredging Company since it began work on the municipal docks. In his report Captain F. W. Burce stated that the trouble experienced with the drain had been practically overcome. He explained that some days as much as 40,000 cubic yards of solid matter had been handled which necessitated the providing for the escape of over 4,000,000 gallons of water per day. The report also states that the grading for the railway into the dock site had been practically completed and that the ties had been strung along for most of the way. About one-half mile of rails has been spiked to the ties.

The Texas Floods.

Brownsboro, Tex.—The accompanying illustration shows one of the flood scenes common all over Texas during the recent floods.



Courtesy, W. J. Stuart, Brownsboro, and Dallas (Tex.) News.
RECENT FLOOD NEAR BROWNSBORO, TEXAS.

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Negligence—Burden of Proof.

Taxicab Co. of Baltimore City v. Emanuel.—In an action for negligence, the burden of proving the negligence in the commission of an act or omission of a duty by defendant, his agents or servants, is on the plaintiff.—Court of Appeals of Maryland, 92 A. R., 807.

Reimbursement for Expenses of Police Officer in Legal Action.

Molinow et al. v. Rafter, Mayor, et al.—Where a city council has ordered that a police officer be reimbursed for his expenses incurred in defending an action against him for an assault claimed to have been committed in the course of public duty, the court will leave it to the city treasurer's discretion whether it will pay such claim, and will not enjoin him, at the instance of a taxpayer, from paying same.—Supreme Court, Equity Term, Niagara County, 152 N. Y. S., 110.

Regulation of Billboards—Power to Enact Ordinance.

Thomas Cusack Co. v. City of Chicago et al.—A city has power to enact an ordinance requiring the consent of a majority of the residence owners to the erection of a billboard in a residence block, under Hurd's Civ. St. 1913, c. 24, § 696, giving cities power to regulate the location of billboards, etc., upon vacant property and upon buildings.—Supreme Court of Illinois, 108 N. E. R., 340.

Granting Right to Use Street.

Seaboard Air Line Ry. Co. v. City of Raleigh et al.—Under the Raleigh charter authorizing the city commissioners to keep streets, sidewalks and alleys in good repair and clean, to establish their width, ascertain the location of those already provided, lay out and open others, and reduce the width of any of them, though a reasonable use of the streets may be granted to a public utility corporation, the commissioners had no power to grant an exclusive right in perpetuity to occupy the sidewalk with a railroad track, so as to prevent a subsequent city board from ordering the removal of such railroad track.—District Court E. D. North Carolina, 219 F. R., 573.

Street Improvements—Advertising for Bids—Completion of Contract by City.

City of Paris v. Bray et ux.—Under a city charter and a general improvement ordinance requiring contracts for street improvements to be made only after public advertisement for competitive bids, where a contract so made after due advertisement was abandoned by the contractor before the completion of the work, the city could take over the work and complete it, as authorized by the contract, without again advertising for bids; the assessment against abutting owners having been based on the contractor's bid, and not having been affected by the city's completion of the work.—Supreme Court of Texas, 175 S. W. R., 432.

Police—Liability of Surety—Interest—Statutes.

Waddle et al. v. Wilson.—Under Ky. St. 1915, § 3497, applicable to cities of the fourth class, providing that every policeman shall give a bond of \$1,000 against unlawful arrest, etc., and Ky. St. 1903, § 3752, as amended by Acts 1908, c. 49 (Ky. St. 1915, § 186d), providing that a bond executed by any state or city official shall be limited in a definite sum, and that recovery against the surety thereon shall be limited to the amount of the penalty, a recovery against the surety of a policeman of a city of the fourth class cannot exceed the penalty fixed by the bond, whether such liability results from a recovery in one action, or in successive actions by different plaintiffs, so that, where a recovery in the first action was less than the penalty of the bond, the surety's payment only satisfied the bond to that extent, and he was liable in another action on the bond for the balance of the penalty, but no interest was recoverable against the surety.—Court of Appeals of Kentucky, 175 S. W. R., 382.

NEWS OF THE SOCIETIES

Calendar of Meetings.

June 1-3.
CONFERENCE OF MAYORS AND OTHER CITY OFFICIALS OF NEW YORK.—Sixth annual convention, Rensselaer Inn, Troy, N. Y. Secretary, William C. Capes.

June 2-4.
SOUTHERN GAS ASSOCIATION.—Hotel Isle of Palms, Charleston, S. C. June 7-9.

NATIONAL CONFERENCE ON CITY PLANNING.—Annual Conference, Detroit, Mich. Secretary, Flavel Shurtleff, 19 Congress St., Boston, Mass. June 14-16.

SOUTHWESTERN WATERWORKS ASSOCIATION.—Annual Convention, Galveston, Tex. Secretary, E. L. Fulkerson, Waco, Tex. June 16-19.

TRI-STATE WATER AND LIGHT ASSOCIATION of the Carolinas and Georgia.—Annual Convention, Asheville, N. C. President, F. C. Wyse, Columbia, S. C. Convention Manager, W. F. Stieglitz, Columbia, S. C. June 22.

MAYORS' ASSOCIATION OF CONNECTICUT.—Bridgeport, Conn. June 22-25.

SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION.—Annual Meeting, Iowa State College, Ames, Ia. Secretary, F. S. Bishop, Univ. of Pittsburgh, Pittsburgh, Pa. June 22-26.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Annual Meeting, Atlantic City, N. J. Secretary, Edgar Marburg, Univ. of Pennsylvania, Philadelphia, Pa. June 25-July 1.

THE COUNTY COUNCILS ASSOCIATION (Great Britain).—National Road Conference and Exhibition, London, England. Business Manager, A. F. May, 13 Victoria Street, Westminster, S. W. London, England. Aug. 2-6.

GOOD ROADS CONGRESS.—San Francisco, Cal., under the auspices of the Tri-State Good Roads Association. Aug. 4-5.

TEXAS GOOD ROADS ASSOCIATION AND COUNTY JUDGES' AND COMMISSIONERS' ASSOCIATION.—Midsummer meeting, Agricultural and Mechanical College of Texas, College Station, Tex. Secretary, Texas Good Roads Assoc., D. E. Colp, San Antonio. Aug. 31-Sept. 3.

INTERNATIONAL ASSOCIATION OF FIRE ENGINES.—Annual Convention, Cincinnati, O. Sept. 13-19.

PAN-AMERICAN ROAD CONGRESS.—Held by American Road Builders' Association and the American Highway Association, Oakland, Cal. September 20-25.

INTERNATIONAL ENGINEERING CONGRESS.—Am. Soc. C. E., Am. Inst. Min. E., Am. Soc. Mech. E., Am. Inst. E. E. and Soc. N. A. & M. E., San Francisco, Cal. Secretary, W. A. Catelli, Foxcroft Building, San Francisco, Cal. Sept. 22-24.

MASSACHUSETTS STATE FIREFMEN'S ASSOCIATION.—Annual convention, Haverhill, Mass. George Wilson, Lynn, Mass., Chairman of Committee. Oct. 11-15.

NATIONAL PAVING BRICK MANUFACTURERS' ASSOCIATION.—Annual Convention, Dayton, O. Secretary, Will P. Blair, B. of L. E. Bldg., Cleveland, O. October 12-15.

AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS.—Annual Convention, Dayton, O. Secretary, Charles Carroll Brown, 702 Wulsin Bldg., Indianapolis, Ind. November 17-19.

NATIONAL MUNICIPAL LEAGUE.—Annual Convention, Dayton, O. Secretary, Clinton Rogers Woodruff, 705 North American Bldg., Philadelphia, Pa. Dec. 27-Jan. 8, 1916.

SECOND PAN-AMERICAN SCIENTIFIC CONGRESS.—Washington, D. C., Department of State, Washington.

AMERICAN SOCIETY FOR TESTING MATERIALS.

The eighteenth annual meeting of the American Society for Testing Materials will be held at the Hotel Traymore, Atlantic City, N. J., June 22-26. The session of Thursday afternoon, June 24, will be devoted to cement and concrete; that of Friday morning, June 25, to ceramics, gypsum and lime, and that of Saturday morning, June 26, to

road materials, timber and rubber. Following is the program:

First Session, Tuesday, June 22, 11 A. M.

Minutes of the seventeenth annual meeting; annual report of executive committee; report of committee D-5, on Standard Specifications for Coal, J. A. Holmes, chairman; report of committee D-6, on Standard Specifications for Coke, J. A. Holmes, chairman; The Fusibility of Coal Ash, A. C. Fieldner, A. E. Hall and A. L. Field; report of committee E-5, on Technical Committees, Edgar Marburg, chairman; report of committee E-6 on Papers and Publications, Edgar Marburg, chairman; election of officers, miscellaneous business.

Second Session, Tuesday, June 22, 3 P. M.

Report of committee A-2 on Standard Specifications for Wrought Iron, S. V. Hunnings, chairman; report of committee A-3, on Standard Specifications for Cast Iron and Finished Castings, Richard Moldenke, chairman; report of committee A-5 on Corrosion of Iron and Steel, S. S. Voorhees, chairman; report of committee D-9, on Standard Tests of Insulating Materials, C. E. Skinner, chairman.

Third Session, Tuesday, June 22, 8 P. M.—On Non-Ferrous Metals.

Annual address by the president; report of committee B-1 on Standard Specifications for Copper Wire, J. A. Capp, chairman; Fatigue of Copper Alloys, Ernest Johnson; Battery Zincs—Some Causes for Defective Service, Robert Job and F. F. White.

Fourth Session, Wednesday, June 23, 10 A. M.—On Steel.

Report of Committee A-1, on Standard Specifications for Steel, C. D. Young, chairman; report of committee A-8, on Standard Specifications for Cold Drawn Steel, C. E. Skinner, chairman; report of committee E-1, on Standard Methods of Testing, G. Lanza, chairman; Elastic Limit, T. D. Lynch; the Elastic Limit of Steel Determined by Transverse Test, and Its Relation to the Tensile Elastic Limit, W. K. Shepard.

Fifth Session, Wednesday, June 23, 8 P. M.—On Heat Treatment of Steel.

The Relation Among Maximum Strength, Brinell Hardness and Sclerometer Hardness in Treated and Untreated Alloy and Plain Steels, R. R. Abbott; Some Neglected Phenomena in the Heat Treatment of Steel, M. E. Leeds; The Charpy Impact Test on Heat-Treated Steel, J. J. Thomas; Some Reasons Why the Use of Heat-Treated Material Has Been Subjected to Criticism, H. V. Wille; Comparison of Physical Properties Obtained from Carbon Forging Steel When Water and Oil Quenched, C. D. Young.

Sixth Session, Thursday, June 24, 10 A. M.—On Testing Apparatus.

The New Physical and Chemical Laboratory of the Pennsylvania Rail-

road Company at Altoona, C. D. Young; The Failure of Materials Under Repeated Stress, H. F. Moore and F. B. Seely; a Laboratory Method of Determining Pressure on Walls and Bins, J. Hammond Smith; a Universal Strainometer of Simple Design, S. H. Graf.

Ninth Session, Friday, June 25, 3 P. M.—On Preservative Coatings and Lubricants.

Report of committee D-1, on Preservative Coatings for Structural Materials, P. H. Walker, chairman; report of committee D-2, on Standard Tests for Lubricants, C. P. Van Gundy, chairman; A Cylinder Friction and Lubricating Testing Apparatus, A. E. Flowers.

The committee on nominations has presented the following ticket: For president, Mansheld Merriman; for vice president, Wm. H. Bixby; for members of executive committee, James H. Giboney, Wm. K. Hatt, John A. Mathews and Edward Orton, Jr.

Joint Committee on Classification of Technical Literature.

Delegates from about twenty national technical and scientific societies met in the United Engineering Society Building, 29 West 39th street, New York City, on May 21, 1915, to perfect a permanent organization, the purpose being to prepare a classification of the literature of applied science which might be generally accepted and adopted by these and other organizations.

There was a generally expressed opinion that such a classification, if properly prepared, might well serve as a basis for the filing of clippings, for cards in a card index, and for printed indexes; and that the publishers of technical periodicals might be induced to print against each important article the symbol of the appropriate class in this system, so that by clipping these articles a file might be easily made which would combine in one system these clippings, together with trade catalogues, maps, drawings, blue prints, photographs, pamphlets and letters classified by the same system.

By request, Mr. W. P. Cutter, the Librarian of the Engineering Societies' Library, and a delegate from the American Institute of Mining Engineers, read a paper on "The Classification of Applied Science" in which, after describing the existing classifications, one of which he is the author, stated that, in his opinion, no one of these although having excellent features, was complete and satisfactory enough to be worthy of general adoption. He outlined a plan whereby a central office could collate all the existing classifications, and, with the help of specialists in the various national societies interested, might compile a general system, which, although perhaps not absolutely perfect, might meet with general acceptance and adoption.

Permanent organization was effected by the election of the following officers: Chairman, Fred R. Low; Secretary, W. P. Cutter; Executive Committee, the

above, with Edgar Marburg; H. W. Peck, Samuel Sheldon.

It was agreed that a special invitation to participate by the appointment of a delegate be sent to other national societies which might be interested in the general plan.

The following societies were represented by delegates: Samuel Sheldon, Library Board, United Engineering Society; Richard Moldenke, American Foundrymen's Association; C. Clifford Kuh, Society for Electrical Development; Cullen W. Parmelee, American Ceramic Society; Sullivan W. Jones, J. A. F. Cardiff, American Institute of Architects; Geo. F. Weston, American Society of Agricultural Engineers; F. L. Pryor, American Society of Refrigerating Engineers; H. W. Peck, American Gas Institute; Nicholas Hill, American Water Works Association; Edwin J. Prindle, L. P. Alford, L. P. Breckenridge, American Society of Mechanical Engineers; F. J. T. Stewart, National Fire Protection Association; J. J. Blackmore, American Society of Heating and Ventilating Engineers; C. F. Clarkson, Society of Automobile Engineers; F. L. Bishop, Society for the Promotion of Engineering Education; George R. Olshausen, U. S. Bureau of Standards; E. C. Crittenden, American Physical Society; Alfred Rigling, Franklin Institute; W. P. Cutter, American Institute of Mining Engineers; Edgar Marburg, American Society for Testing Materials; A. S. MacAllister, National Electric Light Association, American Electro Chemical Society and Illuminating Engineering Society; C. E. Lindsay, American Railway Engineering Association; G. W. Lee, Librarian.

The Executive Committee was charged with the task of enlarging the membership of the committee to include delegates from all similar national organizations, and the preparation of a plan for further action.

The delegates present expressed most hearty and enthusiastic personal interest in any system which might be worthy of general adoption; they could, of course, not promise at this early date, anything more than moral support to the idea, reserving for themselves and for their societies the right to thoroughly examine any system that might be evolved before recommending its adoption.

The name adopted for this organization is "Joint Committee on Classification of Technical Literature," and the temporary address of the secretary, Mr. W. P. Cutter, is 29 West 39th street, New York City.

Carolina Municipal Association.

The committee on arrangements of the Carolina Municipal Association consisting of Mayor T. J. Murphy of Greensboro, ex-Mayor Charles A. Bland of Charlotte, ex-Mayor O. P. Shell of Dunn, and Mayor J. E. Rankin of Asheville, met May 7 and perfected arrangements for holding the annual meeting of the association at Asheville June 17 and 18.

Supervisors' Association of California.

The fifth annual convention of the Supervisor's Association of California was held at San Diego, May 18-22. Among the important papers presented at the meeting were: "Auto Travel in California," by E. G. Kuster; "Care, Maintenance and Future of County Hospitals," by Dr. J. B. Webster; "The Problem of Unemployment in Connection With Road Building," by R. N. Norton; "State Compensation Insurance" by Col. Harris Weinstock.

New York City Conference of Charities and Correction.

The first session of the sixth New York City Conference of Charities and Correction will be held in the Long Island Historical Society Hall on May 26. For two days following the delegates to the conference will continue their work at the United Charities Building in New York City, and at the Hebrew Sheltering Guardian Orphan Asylum, at Pleasantville, N. Y. The objects of the sessions are to afford an opportunity for those engaged in charitable and reform work to confer respecting their methods, principles of administration and results accomplished; to diffuse reliable information respecting charitable and correctional work, and encourage co-operation in humanitarian efforts with the aim of further improving the system of charity and correction in the City of New York.

PERSONALS

Anderson, F. J., has been appointed city engineer of South Bend, Ind.

Atherton, Peter Lee, has been appointed to the Federal Aid Highway Commission of Kentucky.

Bauerle, Edward, has been elected chief of the Waco, Texas, fire department, succeeding the late A. M. Prescott.

Bingenheimer, Jacob H., has been appointed to the Niagara Falls, N. Y., water board.

Burke, Edward J., has been elected chief of the Milford, Mass., fire department.

Burke, James E., has resigned as mayor of Burlington, Vt., in order to become postmaster.

Carlisle, Wm. G., has been appointed secretary to the commissioner of public works of the Borough of Brooklyn.

Carr, James O., has been named public service commissioner for the second district, succeeding Martin S. Decker.

Carr, Tom, has been elected chief of police of Statesville, N. C., succeeding Clarence Connor, who has held the office for 15 years.

Cloyes, Marshall J., twice mayor of Atchison, Kan., and a pioneer in that section, died May 5, aged 88.

Duncan, Archibald, age 47, city commissioner of McKeesport, Pa., died of pneumonia April 11 after an illness

lasting three days. He was born in Scotland and located in McKeesport when a child. He rose from apprentice machinist in the National Tube Works, McKeesport, to be city manager, or commissioner as the position is known. He served 18 years in the city council and for several years was superintendent of parks and city property. Commissioner Duncan was one of the pioneers in playground work and it is to his efforts that McKeesport to-day has its model playgrounds and municipal swimming pools.

Durkee, J. S. W., has been re-appointed chief of police of Montpelier, Vt.

Elwood, Frederick T., formerly acting city engineer of Rochester, has been appointed city engineer.

Fletcher, Dr. H. Quigg, has been elected superintendent of health and sanitation of Chattanooga, Tenn.

Flynn, Daniel P., chief of police of Pittsfield, Mass., died at that place May 8, aged 55. He had been a member of the department for 28 years, and chief for about two years.

French, Alexis H., town engineer of Brookline, Mass., died May 3 at that place after an illness of nearly a year.

James, Harry P., has been appointed director of public safety of Dayton, O.

Johnson, Don., has been appointed chief of police of El Paso, Texas, succeeding I. N. Davis.

Lynch, John T., for 30 years head of the Holyoke, Mass., fire department, died April 22 from a complication of diseases.

Mason, S. Frank, has been re-elected chief of the Keyport, N. J., fire department.

Mathews, T. L., has been appointed chief of police of Galesburg, Ill., succeeding F. R. Hinman.

McCarrel, J. C., succeeds C. P. Walter as highway superintendent for Dauphin county, Pa.

Moore, William S., former city engineer of South Bend, Ind., is now city engineer of Grand Rapids, Mich.

O'Hearn, Patrick, building commissioner of Boston, has been appointed acting commissioner of public works, succeeding L. K. Rourke.

O'Hearn, Patrick, is now acting commissioner of public works of Boston, Mass., succeeding L. K. Rourke.

Otto, John B., has been re-elected city engineer of Williamsport, Pa.

Over, Harry H., has been appointed city treasurer of Sterling, Ill.

Pace, J. C., will succeed Claud Tucker as chief of police of Louisburg, N. C.

Pendergast, Nathan, was recently elected to succeed Chas. H. Folwell as secretary of the New Jersey state water supply commission.

Powell, William N., of Chester, Pa., has been appointed county commissioner to fill the unexpired term of George W. Allen, who resigned.

Price, Marriott, engineer of the park department of Fort Wayne, Ind., has resigned. He will take a position with the Lehigh Portland Cement Co.

Rice, John, has succeeded Otto Pfaff as mayor of Oneida, N. Y. Mr. Pfaff resigned his office.

Riley, Hubert S., has been appointed a member of the Indianapolis, Ind., board of public works.

Sarr, Fred W., has been appointed second deputy highway commissioner of New York state.

Seaman, Arthur M., has been appointed superintendent of road construction for Broome county, N. Y.

Steward, William V., chief of police of Crawfordsville, Ind., has resigned.

The following have been appointed members of the Oswego, N. Y., water service commission: John D. Higgin, Fred M. Riley, David P. Morehouse, William J. Dowdle and Thomas H. King.

Thorpe, John, is chief of the Carthage, N. Y., fire department.

Volkhart, George, has been appointed chief of the fire department of Niles, O.

Wolfinger, W. R., was named engineer in charge of road work in Franklin, Adams, Fulton and Cumberland counties, Pa.

Wymbs, Arthur L., chief of police of Long Branch, N. J., died at his home there April 20.

The following mayors have been elected in Illinois:

Alto Pass.—Julius Rendleman.
Altona.—A. L. Keeler.
Anna.—James Morris.
Batavia.—John Van Borten.
Barry.—George W. Nation.
Belvidere.—W. W. Ray.
Benton.—C. S. D. Rea.
Blue Island.—Jeremiah Jones.
Bristol.—James Scofield.
Brownstown.—L. E. Turney.
Cairo.—Walter H. Wood.
Champaign.—E. S. Swigart.
Charleston.—George C. Crispin.
Carmi.—F. C. Sibley.
Cobden.—J. B. B. Broadway.
Danville.—Will C. Lewman.
Des Plaines.—William Wicke.
Dixon.—Henry Schmidt.
Dongola.—R. S. Dullow.
Duquoin.—Ernest F. Knauer.
East Galesburg.—Frank Parkins.
Edwardsville.—H. D. Mudge.
El Paso.—Horace Baker.
Eureka.—D. H. Bedinger.
Findlay.—J. H. Saylor.
Galena.—F. E. Owens.
Geneva.—M. A. Joshel.
Greenville.—Fred Barr.
Griggsville.—O. W. Winn.
Harrisburg.—T. Y. Gregg.
Herrick.—R. S. Woolard.
Highland Park.—Sam'l M. Hastings.
Hillsboro.—H. S. Butler.
Howard.—Calvin J. Hendrick.
Johnson City.—Harry Barlow.
Joliet.—William C. Barber.
Jonesboro.—G. J. Helig.
Kankakee.—Ben Olgriner.
Kewanee.—B. F. Baker.
Knoxville.—G. L. Lucy.
La Salle.—H. M. Orr.
Lisbon.—Thomas Jones.
Litchfield.—Charles S. Peterson.
Mattoon.—F. E. Bell.

Mendota.—Ralph Madden.
Mill Creek.—A. E. Goodwin.
Millerburg.—John Tischhauser.
Minonk.—Fred Simater.
Monmouth.—Otto Fowler.
Mounds.—I. J. Hudson.
Mount Vernon.—W. S. Payne.
Möwequa.—C. A. Hammill.
Mulberry Grove.—S. G. Enloe.
Naperville.—F. A. Kendal.
Newark.—R. C. Bibbins.
Oswego.—John Herrin.
Ottawa.—E. F. Bradford.
Paris.—W. H. Hoff.
Paxton.—C. W. H. Westbrook.
Peru.—John Massicon.
Pinckneyville.—G. E. Hincke.
Pittsfield.—David L. Benn.
Piano.—C. E. Jeter.
Pocahontas.—Homer Collins.
Pontiac.—H. E. Torrance.
Ramsey.—Louis Witten.
Robinson.—John T. Lindsey.
Rockford.—W. W. Bennett.
Shelbyville.—J. C. Westervelt.
Riverton.—John Goenwright.
Smithboro.—H. B. Titus.
Sorento.—J. V. Livesey.
St. Augustine.—George Davis.
St. Charles.—Edward Hunt.
St. Elmo.—Edward Borland.
Sterling.—A. J. Platt.
Stewardson.—D. M. Muddlestone.
Strausberg.—August Metzer.
Sycamore.—James Beckler.
Tower Hill.—Eli Reed.
Urbana.—O. L. Browder.
Vandalia.—C. A. Janet.
Victoria.—W. A. Sanquist.
Watago.—E. O. Isaacson.
Waterloo.—F. E. Lutz.
Waukegan.—W. W. Pierce.
Windsor.—W. M. Griffith.
Yorkville.—R. A. McClelland.
Zion City.—W. H. Clendinen.

Following town and city officials have been elected in Vermont:

Orange.—Moderator, Frank Hayes; town clerk, Flora A. Peake; treasurer, Edna L. Beard; school director for three years, George W. Simpson; lister for three years, George A. Tillotson; selectman for three years, George W. Davis; road commissioner, William Tucker.

Washington—Moderator, L. W. Slocum; town clerk, M. W. Chamberlain; school director for three years, C. H. McAllister; school director for one year and three months, William Smith; lister, I. L. Wood; selectman, L. W. Seaver; road commissioner, A. L. Patterson.

Chelsea.—Moderator, Stanley C. Wilson; clerk and treasurer, Willard P. Townsend; school director for three years, John M. Comstock; lister for three years, Horace T. Walker; selectman for three years, Houston S. Fitts.

Plainfield.—Moderator, H. C. Cutter; town clerk, J. F. Chamberlain; town treasurer, E. F. Leavitt; road commissioners, William Prescott and George Webster; school director, A. E. Smith; lister, John Ryan; auditors, Frank Hoyt, O. B. Wood, H. C. Cutter.

St. Albans.—J. E. Maun, mayor; B. M. Hopkins, clerk and treasurer.

Waterbury.—Moderator, H. F. Hill; town clerk, J. K. Fullerton; selectman for three years, Carroll Robinson; school director, M. H. Moody; listers, S. C. Wheeler and Thomas Devine; road commissioner, Harry Harvey; treasurer, E. E. Joslyn.

Williamstown.—Moderator, Walter E. Granger; town clerk and treasurer, Glen F. McAllister; lister for three years, P. J. Jeffords.

Middlebury.—Moderator, James B. Donoway; clerk, Joseph M. Burke.

East Montpelier.—Moderator, Harry Daniels; clerk, Clark Sibley; treasurer, Clark Sibley; first selectman, Lewis Sibley; second selectman, C. W. Fitch; third selectman, George L. Pray; road commissioners, W. A. LaPoint, C. G. Gallis.

Randolph.—Moderator, L. B. Johnson; clerk, E. F. Briggs; selectman for three years, A. M. Smith, the others being elected at a previous year; lister for three years, C. S. Hall.

Wattsfield.—Moderator, George W. Wallis; town clerk, W. E. Jones; treasurer, H. M. Bushnell; selectmen, J. E. Berry, E. H. Jones, S. T. Joslin; listers, W. J. Palmer, G. W. Wallis, E. S. Joslin; road commissioner, W. C. Joslin.

Groton.—Moderator, R. A. Davidson; town clerk, Frank M. Page; selectman for three years, Grant Vance; lister for three years, W. W. Pillsbury; road commissioner, John H. Darling.

Northfield.—Moderator, C. D. Edgerton; town clerk, Claude L. Morse; lister for three years, F. J. Houston; selectman for three years, Samuel J. Matson; road commissioner, John E. Plunkett.

Following have been elected in Nebraska:

Tekamah.—S. A. Wassum, mayor; Fred Michael and James Cornish, councilmen; M. S. McGraw, clerk; Ed. Latta, treasurer; Herbert Rhodes, police judge, and Will Conneally, engineer.

Norfolk.—John Friday, mayor.

Lyons.—W. S. Newmeyer and G. W. Little, members of the village board.

Broken Bow.—W. W. Walters, mayor.

Ainsworth.—Cass Moore, mayor; T. E. Ritter, clerk; Hans Rohwer, treasurer; Herman Smith, councilman, first ward, and C. W. Porter, second ward.

Kearney.—C. W. Kibler, mayor.

Wahoo.—William J. Lehr, mayor; George Lodger, clerk; Ernest Hanson, treasurer; I. R. Edwards, councilman, first ward; L. D. Vorak, second ward; Oscar Hanson, third ward.

Oakland.—Alex. Hammerstrom, mayor; clerk, A. F. Wickstrom; treasurer, W. E. Minier; engineer, C. C. Neumann; councilmen, Charles Fisk, first ward; Oscar Samson, second ward.

Columbus.—M. M. Rothleitner, mayor; William Becker, clerk; W. A. Boettcher, treasurer; Louis Brunken, William Kurt, Frank Kersenbrock and Gus Prieb, councilmen; P. J. McCaffery, water commissioner; John H. Parker, engineer.

Pender.—W. B. Warrington and Gus Lander, members of the village board.

(Continued on page 788.)

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

POWER DUMPING

Mechanism Adapted to Contractors' Trucks.

The Autocar Company, Ardmore, Pa., have been working for some time on the development of a power drive to be applied to coal chuting bodies and to contractors' dumping bodies, and announce that they have been successful. They now offer the standard Autocar chassis equipped with either the double litt coal chute body or the Lally type of dump body, and equipped with a mechanism, which is operated from the motor, to raise these bodies. The efficiency of the truck to contractors has thus been greatly increased by this new development. The claims made for the mechanism are simplicity, reliability, reasonable cost and adaptability to standard types of bodies already used on the car.

The source of power is, of course, the car motor, and is taken off the primary gear of the change gear set by attaching a separate housing containing a sliding gear and idler on top of the transmission case, in place of the usual cover plate. This admits of the use of the car clutch as the means of connecting and disconnecting the power of the lifting mechanism. This shifting of the auxiliary gear is controlled by a separate hand lever at the driver's right hand, and is interlocked with the gear control of the car in such a way as to prevent the meshing of the auxiliary gear unless the driving gears are in neutral, and also prevents meshing the driving gears when the auxiliary gear is engaged.

When the body has reached the limit of its travel, it trips an automatic release for the clutch, preventing accidental damage due to carelessness of the operator. A ratchet brake is located on the winding shaft, which permits the body to raise, but prevents its lowering until released by the operator. The control of this brake is by a hand lever at the operator's right. As an additional safeguard, an emergency pawl is located at the circumference of the gear on the winding shaft, which the operator can apply if he leaves the seat, thus insuring against accident if anyone meddles with the control. The body lowers by gravity under the control of this brake. The body raises with load in about 15 seconds to an angle of 45 degrees, thus insuring easy delivery of the load. The tail gate control is automatic, or by lever from the driver's seat, so that the complete operation can be done without the driver leaving his place.

For increasing the rapidity of dumping and thus saving time and labor on hauls on every kind of contractors'

work, the auto dump mechanism should certainly prove an effective aid. The accompanying illustration shows the drive in action.

containing coarse mineral aggregate found in asphaltic concrete or bituminous pavements may be run. The machine is made in two sizes: No. 1, 50

"DULIN ROTAREX."

For Extracting Bituminous Aggregates.

The "Dulin Rotarex" is designed for extracting bituminous aggregates and is adapted for bitulithic, macadam or ordinary surface mixtures. The machines are equipped with specially constructed vertical type motors that will operate on either alternating current, 110 volts, 60 cycles or direct current, 110 volts—or on 220 volt circuit with suitable resistance.

An aluminum bowl is fitted with a hollow axle which fits over the motor shaft and is surrounded by a cylindrical copper shell which catches the discharged soluble material. The bottom of the shell is so inclined as to drain through a spout. The copper bowl is fitted with a two-piece cover, the smaller of which is removed when additional solvent is added. Filter paper is placed beneath the filter ring and both are inserted between the cover and edge of the aluminum bowl. The cover is held firmly in place by a filler screw which engages with the threaded hollow axle. Through this filler screw the solvent is added as needed. A heavy flywheel is attached to the motor shaft. This has the effect of balancing the load and consequently reducing vibration to a minimum.

It is claimed that complete extraction can be made in from five to ten minutes and large samples are handled as quickly as small ones. Samples



DULIN ROTAREX.

grams capacity, and No. 2, 1,000 grams capacity.

The accompanying illustration shows the Dulin Rotarex, which is made by the Braun Corporation, 363-371 New High street, Los Angeles, Cal.

NON - RATTLING MANHOLE COVER.

One of the serious objections to manhole covers, whether on lines of sewers, wire or steam conduits or other underground covers, is their tendency to rattle as teams pass over them and the noise thus produced. The cover illustrated herewith can not rattle; in addition, it has the advantage of being easily removed. The general principle



AUTOCAR POWER-DRIVE DUMP MECHANISM.

is the use of inclined surfaces by which the cover is wedged firmly into position, and it is raised by sliding one inclined surface on another.

The lid is like any other (any pattern of top may be used) except that there is a series of flange pieces projecting

of the flange pieces, which fit down into the spaces between lugs, the cover revolving slightly as it lowers. The flanges and spaces are so proportioned that the former act as wedges, the lid not seating itself on the tops of the lugs. Therefore, there is no possibility of rocking the lid, which is jammed tight into position.

Two of the lugs extend to the top of the casting on opposite sides, and corresponding openings are left in the lid. To raise the lid, a bar or pick may be inserted in the slot between the top of one of these lugs and its opening in the lid, and by prying, the flange pieces slide on the inclined faces of the lugs and the lid rises and is easily removed. To prevent the lid being carelessly dropped into the manhole, other lugs are placed under the spaces between the lugs described.

These covers are used in Minneapolis and St. Paul and in Chicago by the water and electric departments. The Tri-State Telephone Co. and Minneapolis Co. have adopted it cover.

The cover has been patented by Owen T. Dougherty, of St. Paul. It is manufactured by the D. & D. Safety Cover Co., of 2423 University Avenue, St. Paul, Minn.

THE MANEY SCRAPER.

Four-Wheel—One Yard and Half-Yard Capacities.

The demand for a practical excavator of large capacity with portability of the

two-wheeled scraper yet designed for results equivalent to the steam shovel has led to the development of the Maney four-wheel scraper. The scraper is used in road building, street excavation, grading and snow removal, and has a capacity of one cubic yard. The operating costs are claimed to be comparatively low. The loading is done by a four-horse snap team or a tractor, the latter giving a rate of a load per minute. The Maney dumps its load, spreads the dirt in layers of six inches and less and gives the additional compacting with the wheels.

All controlling levers are conveniently located. One lever pushed slightly to the right allows the pan to drop into loading position—the same lever thrown to the left stops the lowering of the pan at any point. Another lever pulled to the right stops the winding of spool and raising of pan at any point desired, and this may be automatically done by a convenient arrangement to throw the lever. A foot lever pushed down throws in the rear wheel clutch and the turning of the wheels winds up the chain, raising the pan out of the ground to carrying position. A dumping lever raised by hand releases the end gate and dumps load instantly from the rear. The Maney will therefore almost finish grades because of the delicate adjustment possible in the raising lever. The pan is slightly wider in the rear than in the front, allowing sticky material to slide out easily.

The machine is strongly built, the head block casting being particularly substantial. The "goose-neck" is made of heavy channels and is strongly reinforced. The cutting bit on the pan is of double beveled crucible steel and is removable. A strong spring supports the tongue, thus relieving all neck weight—a serious objection in the old-style wheeler. The front wheels are equipped with special oscillating axle, allowing them to adapt themselves to all ground conditions. The shipping weight is 2,200 pounds.

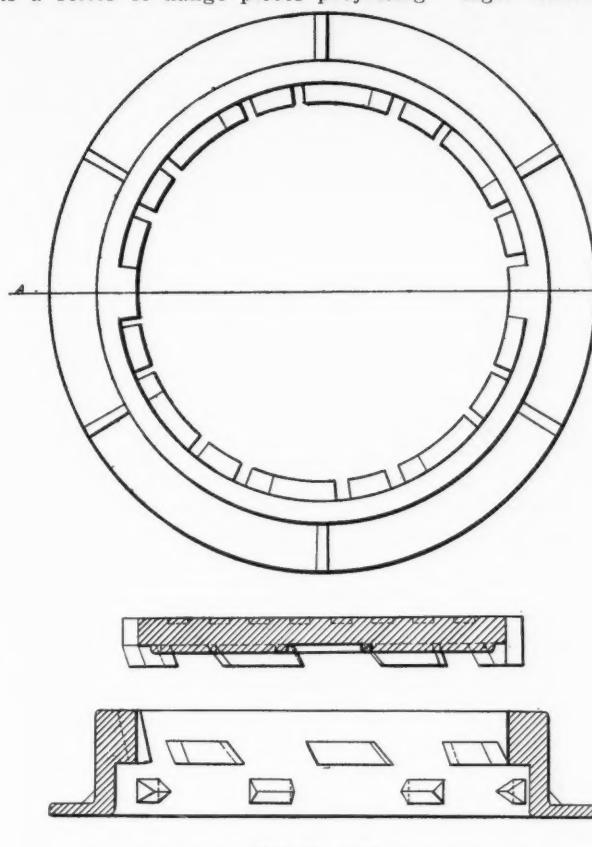
The "Little Maney" has a capacity of one-half cubic yard and weighs 1,500 pounds. It is designed for smaller loads and shorter hauls. Wheeler holders and dump men are dispensed with, thus effecting a large labor saving. A two-horse snap team loads it.

These scrapers are in wide successful use. They are made by the Baker Mfg. Co., Springfield, Ill. The accompanying illustration shows the "Maney" with the pan in loading position.

SPRAY NOZZLES.

For Asphalt in Highway Construction and Maintenance.

The widespread use of heavy bituminous binder in road construction work has found the ordinary spray nozzle unsuitable for anything but light oils. The nozzles clogged very easily and the heavy binder at a temperature of 350° and sprayed under pressure could not be placed through them. Mixing method and pouring pot method have been found unsatisfactory. A spray

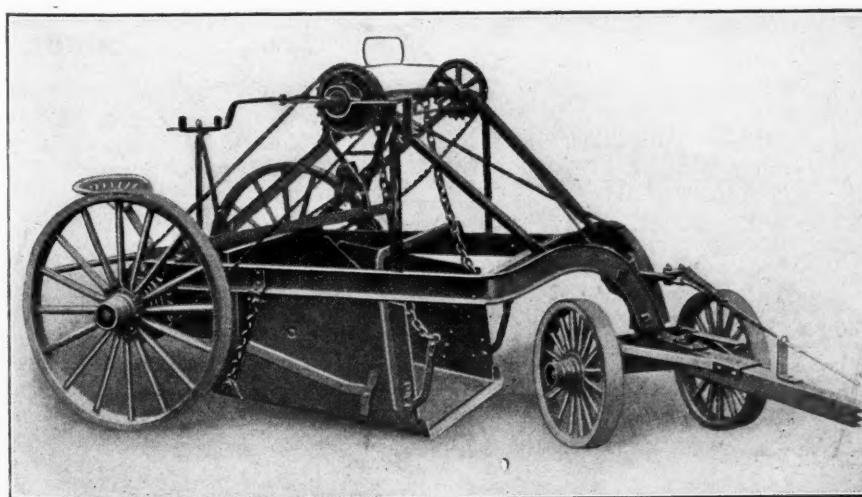


NON-RATTLING MANHOLE COVER.

vertically from the outer edge of the lower surface. There are eight of these, each with one edge making an angle of 45 degrees with the horizontal and the other edge an angle of 60 degrees, and each having a length of about one-twelfth of the circumference. On the inside of the head are six lugs projecting from the surface, these being about 1½ inches high and about 1½ inches below the top of the casting. The edges of these lugs make angles with the horizontal corresponding to those

General Electric as their standard.

The cover has been patented by Owen T. Dougherty, of St. Paul. It is manufactured by the D. & D. Safety Cover Co., of 2423 University Avenue, St. Paul, Minn.



MANEY FOUR-WHEEL SCRAPER.

nozzle that will handle this heavy material is therefore of decided value.

The new nozzle is used on the spraying machine in the ordinary way and is so constructed that it can easily be taken apart and reassembled without delay. It consists as shown, of three parts—a wing-flanged piece that is put between the two other pieces, which are screwed together, the middle piece producing the rotary motion. The nozzles are claimed to spray at the rate of $\frac{3}{4}$ to $1\frac{1}{2}$ gallons per square yard, coating the stone evenly on every accessible side. It is claimed that these nozzles will cut the cost of constructing a bituminous macadam road 20 per cent. by expediting the work and that with a good force, a road of two 3-inch layers of No. 1 rock, with double spraying and heavy binder, can be laid at a cost of 70 cents a square yard or less. The operating pressure should be at least 50 pounds per square inch with heavy binders and 25 pounds with tar compounds. These nozzles are being used, among others, by the Massachusetts Highway Commission and the Barrett Manufacturing Co. They will spray Bermudez, Standard Binders B and C and the heavier grades sold by the Texas Co., the Indian Refining Co., the Gulf Refining Co., and others.

The right-hand nozzle in the illustration is No. 10, for hand spraying, such as in patching or using Tarvia and it has a 9-16-inch orifice. The other three illustrations show the parts of the machine nozzle. These nozzles are made by the Spray Engineering Co., 93 Federal street, Boston, Mass.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago.—The city of Chicago has bought 2,300 tons of 16-lb. 24-inch pipe, but this is the only business of prominence recorded. A number of small orders were placed, but even the routine tonnage was curtailed. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$23.50; 16-inch and up, \$23. Birmingham.—Pipe makers are interested in the recent decision lowering freight rates \$2 per ton to the Pacific coast, and much future business is expected in that territory. Demand at present is sufficient to justify extensive operations. Quotations: 4-inch, \$20; 6-inch and up, \$18. New York.—Bids on great pipe contract at Philadelphia have been opened. Woburn, Mass., opened bids on 500 tons of 6 to 16-inch pipe. All bids were rejected by Salem, Mass., and no date has yet been set for

receiving new proposals. The Boston contract for 150 tons of special pipe for high-pressure service was secured by the Davis & Farnum Mfg. Co. at \$57 per net ton. No new municipal contracts are in sight. Prices are holding well. Quotations: Class B and heavier, \$22 to \$22.50; Class A, \$23 to \$23.50.

Lead.—Quotations: New York, \$4.30; St. Louis, \$4.225.

The Sanitation Corporation, 50 Church street, New York City, is installing a sewage treatment plant consisting of Riensch-Wurl screens for the treatment of 12 million gallons of sewage per day for the Borough of Brooklyn, N. Y.

The Pacific Flush Tank Co., Chicago and New York, announce the removal of their Chicago office from the Temple Bldg., 108 S. La Salle street, to their new building, 4241 East Ravenswood avenue, where they have a large testing and experimental station. The eastern office, in charge of S. F. Miller, president of the company, is still maintained in the new suite, Rooms 1414, 15 and 16, Singer Bldg., New York.

The United States Cast Iron Pipe & Foundry Company, Philadelphia, Pa., has opened a new office in Kansas City, Mo., at 1404 R. A. Long Building. This office will be under the charge of R. C. Clifford, formerly of the St. Louis office of the company.

James Boyd & Bro., Inc., Philadelphia, Pa., have been officially notified by the City of Philadelphia that they have been awarded contract to furnish that city with the following: One type RC 85 ft. aerial truck; one type R C 65 ft. aerial truck; two city service trucks, style SD; two combination trucks, style CD; five tractors, for steam fire engine, type MD.

The aerial trucks are to be of the new worm and gear type manufactured by this firm, and equipped with the power attachment which will both raise and lower the ladder and revolve the turntable. The aerial ladders are also equipped with an automatic stop which prevents any accident from carelessness or excitement. The tractors for the city are also of the new worm and gear type drive. This tractor has no chains and sprockets.

Among other orders recently received by James Boyd & Bro., Inc., are: City service truck for Southbridge, Mass., type SC; triple combination chemical and pumping engine for Perth Amboy, N. J., type PB; aerial truck for Read-

ing, Pa., type RC (75 ft.); combination truck for Williamsport, Pa., type CD; triple combination car for Plains, Pa., type PB; chassis for Trenton, N. J., type CD; city service truck for Kokomo, Ind., type SD.

PERSONALS

(Continued from page 785.)

Grand Island—Charles G. Ryan re-elected mayor.

West Point—Mayor, M. E. Kerl; clerk, Gus Hanft; treasurer, Frank Miller; school board, O. C. Anderson and Herman Zeplin; councilmen, John Schueth, first ward; E. E. Von Seggern, second ward; Isaac Gehris, third ward.

Recent elections and appointments are:

Lyons, Kan.—City attorney, Ben Jones; city clerk, R. S. Turner; city engineer, Sam Ainsworth; fire department chief, J. W. Williams; marshal and street commissioner, Alex Lantow. Following committees: Street and Alley—William Porter, chairman; J. M. Root, A. W. Volkmann. Water—J. M. Root, chairman; E. A. Westwood, A. H. Meyer; Fire and Light—E. A. Westwood, chairman; A. C. Blair, R. H. Rhoads. Park—R. H. Rhoads, chairman; William Porter, George Lantz.

Trenton, N. J.—Mayor Frederick W. Donnelly, director of the department of affairs; George B. LaBarre, director of the department of public safety; William F. Burk, director of the department of parks and public property; Edward W. Lee, director of the department of finance and accounts, and J. Ridgeway Fell, director of the department of streets and improvements.

Bay City, Mich.—President of council, R. V. Mundy; city attorney, S. G. Houghton; city engineer, H. C. Thompson; board of public works, H. G. Boehringer; street commissioner, John Northrup.

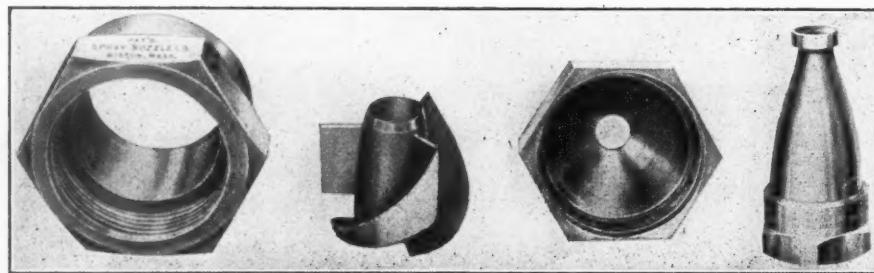
St. Joseph, Mich.—Appointments, mayor pro tem, Wells; finance, Wells and Miller; streets and alleys, Fay, Kneibus, Wells and Witt; police, Wells and Fowler; public health, Beers and Fowler; ordinance, Witt and Miller; park, Kneibus and Beers; bridges, Herman and Miller; fire, Miller and Herman; public property, Miller and Fay.

Passaic, N. J.—Commissioners, John H. Kehoe, George N. Seger, William A. Reid, John H. McGuire, J. Hosey Osborn.

Hutchinson, Kan.—City clerk, Ed. Metz; city purchasing agent, A. E. Noonan; city treasurer, Mrs. Ollie May; city engineer, G. L. McLane; street superintendent, Lew Steinbeck; city attorney, W. F. Jones; chief of police, Geo. Hern; fire chief, Al Stout.

Kansas City—C. C. Green was re-elected mayor; James L. Beggs, commissioner of streets and public improvements.

Jewell City—W. T. Fay, mayor; Fred James, police judge; F. E. Ruggles, W. A. Watson, J. W. Berry, W. J. Carpenter and Burt Cluster, councilmen.



ASPHALT NOZZLES.

Hastings, Neb.—Raymond Crosson, chief of police; C. A. Parks, park superintendent; C. A. Heartwell, street commissioner. Committees: Water and light, Gardiner, Renner, Butzirus; claims, Renner, Miller, Livingston; fire and police, Butzirus, Harm, Livingston; sidewalks, streets and alleys, Livingston, Gardiner, Butzirus; parks, Gardiner, Zinn, Van Every; sewer and water extension, Van Every, Harm, Gardiner; health, Harm, Renner, Van Every.

Hawthorne, N. J.—Arthur Rhodes, Dr. Sylvester Utter and Reuben MacFarlan, commissioners.

Winooski, Vt.—A. E. Dubuc, village president; John G. Piche, village clerk; Fred Bedard, water commissioner.

Leavenworth, Kan.—Following have been appointed: C. P. Rutherford, city attorney; Dr. Stewart McKee, city physician; Fred Metschan, city clerk; Miss Maud Root, city auditor and assistant city clerk; J. L. Clark, city inspector; Harry Perkins, city engineer; W. B. Shaughnessy, chief of police; M. Bahler, fire chief; Matt. Malone, street commissioner.

Grand Island, Neb.—Following committees have been appointed: Finance—Meyer, Hehnke, Hanna, Menck; streets and alleys—Hehnke, Broadwell, Hanna, Bock; city property—Broadwell, Menck, Ballenger, Rask; lights, fire and water—Hanna, Hehnke, Broadwell, Meyer; police and board of health—Bock, Hanna, Hehnke, Broadwell; purchasing and auditing claims—Ballenger, Menck, Rask, Meyer; sewers—Broadwell, Hehnke, Hanna, Ballenger; parks—Bock, Hanna, Meyer, Ballenger.

Salida, Colo.—William C. Anderson, mayor; city clerk, H. H. Parker; treasurer, Mrs. Rose Craig; aldermen, Arenberg, Means, Dean, Sandusky, Ramey and Roberts.

Rome, Ga.—H. J. Stewart, chief of police; J. A. Sharp, chief fire department; Thomas H. Booz, superintendent of public works.

Ballston Spa, N. Y.—Village Attorney, John H. Burke; superintendent of water works, Hiram Sweet; superintendent of disposal plant, James H. Lowell; assistants, James Clute, Peter Earl; chief of police, James J. O'Brien.

Hagerstown, Md.—Henry Davis, city clerk; J. B. Ferguson, city engineer; C. A. Ritchey, V. D. Miller, Jr., and L. J. Onick, street commissioners.

North Reading, Mass.—Albert G. Barber, Irving F. Batchelder, Joseph D. Gowing, selectmen and overseers of poor; Arthur F. Upton, clerk; Joseph D. Gowing, treasurer and tax collector; Irving F. Batchelder, assessor; Leland D. Batchelder, school committee; Harvey G. Turner, highway surveyor.

Saugus, Mass.—Selectmen, F. P. Bennett, H. M. Forristall and George L. Nourse; Henry A. Parker, town clerk; J. A. Raddin, water commissioner.

Essex, Mass.—Selectmen, C. M. Cogswell, Aaron Cogswell and Albion Riggs; F. E. Raymond, moderator.

Manchester, Mass.—F. G. Cheever,

L. W. Floyd and E. S. Knight, selectmen; Alfred S. Jewett, town clerk; Senter Stanley, water commissioner; James Hoare, sewer commissioner.

Rockport, Mass.—John H. Dennis, John W. Marshall and Eli Morgan, selectmen; B. G. Russell, town clerk; Frank E. Elwell, water commissioner; Fred Smith, highway surveyor.

Fairfax, Vt.—Moderator, W. D. Stewart; town clerk, George Lawton; school director, F. W. Shepardson; lister, G. W. Craft; selectman, G. L. Butler; road commissioners, H. F. Pollard, B. L. Sweeney.

Stowe, Vt.—Chairman, C. M. Watts; clerk, J. R. Wells; trustees, A. A. Pike, E. C. Russell and A. C. Morrill; treasurer, H. E. Pike; water commissioners, F. E. Safford, T. W. Barrows and H. E. Shaw.

Elkins, W. Va.—Dr. A. M. Fredlock, mayor; councilmen, S. J. Johnson, A. D. Talbott, O. G. Coberly and Dr. H. W. Daniels.

Bolton, Vt.—Town clerk and treasurer, F. E. Phillips; road commissioner, H. E. Muzzy; overseer, Edward Green; school director for three years, George Streeter; selectman, George Gile; lister, John Barlow.

Kennebunk, Me.—Selectmen, assessors and overseers of the poor, Harold H. Bourne, Fred W. Jones, Abner Boothby, Jr.; treasurer, Joseph D. Bragdon; town clerk, Albert W. Messerve; auditor, William H. Littlefield; collector of taxes, Fred J. Wicher; forester, Frank A. Dresser; electric light commissioner, Fred E. Norton; chief engineer fire department, Elmer M. Roberts.

Burlington, Vt.—A. S. Drew, mayor; C. L. Woodbury, E. A. Luck, G. H. Lessor, F. J. Dwyer, A. G. Mansur and A. B. Buell, aldermen.

Miles City, Mont.—Paul Allmayer, city clerk; G. C. Pruett, city engineer, and O. T. Jackson, chief of police.

Mocksville, N. C.—V. E. Swain, mayor; J. B. Johnstone, E. E. Hunt, Jr., J. P. Green, G. E. Horn, C. C. Sanford, commissioners.

Reidsville, N. C.—Mayor, Dr. M. P. Cummings; commissioners, G. C. Crutchfield, Dr. J. W. McGehee, J. E. Amos, R. H. Tucker, J. Ed. Smith.

Billings, Mont.—City clerk, E. S. Judd; city attorney, Charles Taylor; city engineer, E. M. Sneckenberger; assistant city engineer, John N. Edy, city physician, Dr. Mott H. Arnold; street commissioner, Frank Bryan.

The new committees of the council are as follows: Sidewalks and curbs—Aldermen Lundborg, Shepherd and Hoe; Water—Aldermen Simineo, Lundborg and Snidow; Lights and public buildings—Aldermen Givens, Simineo and Schwanz; Fire—Aldermen Shepherd, Simineo and Schwanz; Sewer—Aldermen Schwanz, Sweeney and Martin; Streets and alleys—Aldermen Hoe, Lawson and Snidow.

Butte, Mont.—City clerk, Albert Dockstader, Jr.; city health officer, Dr. T. V. Moore; sanitary inspectors, Charles Buchanan and P. A. Sullivan; street commissioner, Melvin D. Cahill;

assistant city engineer, Joseph J. Armstrong; city electrician, J. C. Roberts.

Monroe, La.—Mayor, H. D. Apgar; councilmen, P. M. Atkins, Will Atkinson, L. R. Powers, Joe Adams, Sam Kaplan, J. T. Austin, W. A. Walker, O. P. Slack and W. S. Culpepper.

Winston-Salem, N. C.—Mayor, O. B. Eaton; aldermen, Messrs. W. L. O'Brien and A. J. Farrell of the first ward; Col. G. E. Webb and A. R. Lewis, of the second; C. W. Snyder and R. H. Shelton from the third; Louis Owen and F. A. Fogle, from Salem ward.

Concord, N. C.—C. A. Isenhour, mayor; S. L. Bost, J. T. Sapp, C. A. Ritchie, G. C. Love, S. C. Smart and A. R. Hoover, aldermen.

Bamberg, S. C.—E. C. Hays, re-elected mayor; aldermen, E. H. Henderson, C. W. Rentz, H. L. Hinant, A. M. Denbow, J. B. Brickle and C. B. Free. H. J. Bradham, member of the board of public works.

Madison, N. C.—W. C. Jones, re-elected mayor; commissioners, T. R. Pratt, H. N. Benford, Dr. J. T. Taylor, R. M. Cardwell, H. J. Penn and Henry Webster.

Omaha, Neb.—Mayor Dahlman, commissioners Hummel, Kukel, Withnell, Butler, John C. Drexel and Walter S. Jardine.

Following officers have been elected in North Carolina:

Maxton.—Mayor, T. M. Parsons; commissioners, J. C. McClelland, A. M. McNair, J. D. Medlin and J. S. McRae; water board, G. B. Sellers, T. O. Evans and E. T. Carrowan.

Kinston.—Fred I. Sutton, mayor; Ernest V. Webb, R. R. Rouse, H. P. Fort, L. P. Tapp, M. M. Happer and W. B. Douglass, members of council.

La Grange.—Mayor, Dr. J. W. P. Smithwick; commissioners, C. C. Aldridge, F. S. Isler, J. W. Stanton, R. F. Hadley, J. W. Graham and P. R. Kinsey.

Shelby—Col. J. T. Gardner, mayor; aldermen, J. G. Dudley, Orlando Elam, T. O. Grigg and T. W. Hamrick.

Lexington.—Mayor, Charles Young, re-elected; aldermen, North ward, T. J. Taylor, T. F. Grimes; East, J. T. Lowe, F. O. Sink; South, W. J. Lancaster, J. W. Broadway; West, George L. Hackney, N. A. Henshaw.

Fayetteville—John C. Gibbs, mayor.

Cornelius.—J. B. Readling, mayor; aldermen, P. A. Stough, Joe Sherrill, William Long, Ham White, Robert White.

Gastonia.—Col. C. B. Armstrong, mayor; aldermen, B. F. S. Austin, J. M. Shuford, A. B. Elliott, T. M. McIntyre, A. J. Kirby, W. F. Kincaid, R. M. Johnston.

Thomasville.—Mayor, Zed Griffith; aldermen, Charles F. Lambeth, M. H. Stone, T. A. Finch, E. W. Cates, J. W. Boyles.

Mount Airy—C. Bivens, mayor; town commissioners are: W. T. Haynes, T. N. Brock, J. F. Yokley, F. P. Sparger and B. Beasley.

Raleigh.—Mayor, James I. Johnson, commissioners, O. G. King and R. B. Seawell, re-elected.

ADVANCE CONTRACT NEWS

**ADVANCED INFORMATION
BIDS ASKED FOR**
**CONTRACTS AWARDED
ITEMIZED PRICES**

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

| STATE | CITY | RECD UNTIL | NATURE OF WORK | ADDRESS INQUIRIES TO |
|-------------------------|------------------------|--|---|----------------------|
| STREET AND ROADS | | | | |
| Ky., Louisville | Noon, June | 5.. Improving county road..... | O. P. Pollitt, Co. Clk. | |
| Ky., Pineville | June | 5.. Constructing 20 miles of road to cost \$70,000..... | County Fiscal Court | |
| Col., Alamosa | Noon, June | 5.. Constructing state road..... | Fred Catchpole, Sec. Bd. Const. | |
| Ky., Vanceburg | Noon, June | 5.. Constructing 7 miles macadam road..... | O. P. Pollitt, Co. Clerk | |
| N. J., Rahway | 8 p.m., June | 5.. Furnishing & applying 12,000 gals. heavy bitu. material. | Charles T. Gunn, Chr. Committee on Streets | |
| O., Columbus | 2 p.m., June | 6.. Constructing 4,000 ft. of road..... | F. S. Miller, Station C. Clk. | |
| Colo., Boulder | 10 a.m., June | 5.. Surfacing | County Commissioners. | |
| Mo., Brunswick | 4.30 p.m., June | 5.. Vertical fibre paving block and stone curb; also grading and paving | City Clerk. | |
| Ill., Chicago | Noon, June | 5.. Excavating, regrading and resurfacing..... | Special Park Commission. | |
| D. C., Washington | 11 a.m., June | 5.. Resurfacing Fort Myer military roadway..... | J. B. Houston, Depot Q. M., U. S. A. | |
| N. J., Camden | 11 a.m., June | 7.. Furnishing 3/4 and 1 1/2-inch broken trap rock..... | J. P. Earle, Supv. of Rds. | |
| Minn., Clarksdale | June | 7.. Constructing four miles gravel road..... | W. L. Brannon, Co. Hwy. Eng. | |
| N. J., Hackensack | June | 7.. Resurfacing 11,510 yds. with bituminous concrete..... | F. J. Thompson, Clk. Hackensack Impt. Com. | |
| Ky., Ashland | June | 7.. Laying about 6,600 yds. vit. brick..... | City Clerk. | |
| Pa., Wilkes-Barre | 2 p.m., June | 7.. Repairing county road..... | F. R. Hendershot, Co. Cont. | |
| Pa., Allentown | June | 7.. 5,900 yds. brick or concrete pavement..... | C. W. Grossart, Boro. Engr. | |
| Cal., San Jose | 11 a.m., June | 7.. Furnishing 50,000 bbls. Portland cement for road work..... | H. A. Pfister, Clk. Bd. Supv. | |
| Minn., St. Paul | 10.30 a.m., June | 7.. Curbing, levelling and improving several streets..... | August Hohenstein, Pur. Agt. | |
| Miss., Raymond | June | 7.. Graveling two streets..... | W. W. Downing, Chancery Clk. | |
| O., Cleveland | Noon, June | 7.. Grading and flagging streets..... | F. A. Pease Engr. Co. | |
| Fla., Tavares | June | 7.. About 19 miles road construction..... | M. V. Simpson, Comr. | |
| Ind., Kentland | 2 p.m., June | 7.. Grading, paving and improving roads..... | S. R. Sizelove, Co. Aud. | |
| Ind., Jeffersonville | 10 a.m., June | 7.. Grading and macadamizing road..... | G. W. Stoner, Co. Aud. | |
| Ind., Franklin | 2 p.m., June | 7.. Grading, paving and improving road..... | H. L. Knox, Co. Aud. | |
| O., Arlington | June | 7.. 6,000 yds. brick pavement; curbing..... | City Clk. | |
| Ind., Portland | 10 a.m., June | 7.. Grading, draining and paving with crushed stone..... | John Bonifas, Aud. Jay Co. | |
| Wash., Ellensburg | 2 p.m., June | 7.. Grading and graveling..... | M. M. Emerson, Co. Engr. | |
| Tex., McKinney | June | 7.. Constructing about 215 miles gravel, macadam and concrete roads..... | John Mead, Co. Engr. | |
| Miss., Hazelhurst | June | 7.. About \$50,000 worth gravel roads construction..... | X. A. Kramer, Engr., Magnolia Arlington Hotel. | |
| Wis., Hortonville | 2 p.m., June | 7.. Excavating and filling cut..... | G. B. Edmondson, City Aud. | |
| N. D., Cooperstown | June | 7.. Concrete walks for one year..... | H. J. Walker, Boro. Secy. | |
| Pa., Kittanning | 8 p.m., June | 7.. 1,500 yds. street paving and curbing..... | Harry Pfister, Clk. Supvsrs. | |
| Cal., San Jose | 11 a.m., June | 7.. Improving roads | J. B. Enlow, Co. Aud. | |
| Ind., English | 2 p.m., June | 7.. Constructing stone road..... | L. W. Sands, Co. Aud. | |
| Ind., Greensburg | 1 p.m., June | 7.. Road construction | C. G. Reifel, Co. Aud. | |
| Ind., Brookville | 1 p.m., June | 7.. Stone road construction..... | C. L. Airhart, Co. Aud. | |
| Ind., Green Castle | 2 p.m., June | 7.. Gravel road construction..... | Wm. R. Roy, Hwy. Comr. | |
| Wash., Olympia | June | 7.. About 3 1/2 miles grading and surfacing..... | Lawrence Wood, Co. Aud. | |
| Ind., Greenfield | 10 a.m., June | 7.. Furnishing crushed stone | O. Halden, Co. Aud. | |
| Minn., Duluth | 2 p.m., June | 7.. Constructing nine miles of road..... | County Commissioners. | |
| Ala., Camden | June | 7.. Grading and graveling road | J. J. Hayes, Mayor. | |
| Miss., Vicksburg | June | 7.. Constructing sidewalks in several streets..... | John Bonifas, Co. Aud. | |
| Ind., Portland | 10 a.m., June | 7.. Grading, draining and paving with crushed stone..... | N. J. Powell, City Aud. | |
| N. D., Larimore | 7 p.m., June | 7.. Constructing sidewalks and curbs for 1915..... | G. H. Stoddart, City Aud. | |
| S. D., Brookings | 8 p.m., June | 7.. Constructing walks, crossings and culverts..... | A. L. Durrance, Clk. of Court. | |
| Fla., Arcadia | Noon, June | 7.. Clearing and grubbing about 110 miles of road..... | M. J. Boyd, City Auditor. | |
| N. D., Valley City | 8 p.m., June | 7.. Constructing and repairing sidewalks and crosswalks..... | J. J. Hayes, Mayor. | |
| Miss., Vicksburg | 5 p.m., June | 7.. Constructing sidewalks in several streets..... | F. E. Robbins, City Clk. | |
| Mont., Hamilton | 3 p.m., June | 7.. Constructing road | S. C. Webster, Co. Clk. | |
| Mont., Missoula | June | 7.. Road construction | A. G. Browning, Boro. Sec. | |
| Pa., West Pittston | 7.30 p.m., June | 7.. Repaving | H. J. Kueelling, Co. Hwy. Com. | |
| Wis., Milwaukee | 2 p.m., June | 7.. Grading and concrete paving | S. Weil, Sec. | |
| La., Alexandria | 7.30 p.m., June | 7.. Bitulithic pavement | City Engineer. | |
| Neb., Norfolk | 5 p.m., June | 7.. Cement walks | | |
| Wis., Clintonville | 6 p.m., June | 7.. Reinforced concrete vit. block and creosoted wood block pavements | City Clerk. | |
| Minn., Worthington | 2 p.m., June | 7.. State road construction | G. Swanberg, Nobles Co. Aud. | |
| N. J., Hackensack | 8 p.m., June | 7.. Bituminous concrete paving; concrete sidewalks, etc..... | Clerk. | |
| Mass., Boston | Noon, June | 7.. Asphalt or bitulithic | Rm. 500, City Hall Annex. | |
| N. Y., Albany | 3 p.m., June | 7.. Various street improvements | I. Wachsmann, Sec. Bd. C. & S. | |
| Mich., Ypsilanti | 3 p.m., June | 7.. Cement curbing | Sumner Damon, City Clk. | |
| Wash., Seattle | 10 a.m., June | 7.. Various street improvements | E. B. Bagley, Sec. B. P. W. | |
| Mo., Joplin | June | 8.. Two blocks creosoted block pavement | J. J. McAfee, City Engr. | |
| Ky., Covington | 10 a.m., June | 8.. Concrete road construction | Co. Clerk's Office. | |
| Ia., Sheldon | 8 p.m., June | 8.. 13,500 sq. yds. vit. brick, Portland cement, concrete or asphaltic concrete pavement | K. C. Gainer, Engr., United Bank Bldg., Sioux City. | |
| Ind., Marion | 2 p.m., June | 8.. Grading, paving and improving road, three jobs..... | E. H. Kimball, Co. Aud. | |
| Ind., Sullivan | June | 8.. Constructing five gravel roads | W. S. Bicknell, Co. Aud. | |
| N. D., Mohall | 2 p.m., June | 8.. Road grading | Peter Carlson, Co. Aud. | |
| Ind., Covington | 2 p.m., June | 8.. Grading, paving and improving | H. W. Newlin, Fountain Co. Auditor. | |
| Ind., Kokomo | 10 a.m., June | 8.. Highway improvements | E. B. Swift, Howard Co. Aud. | |
| Wash., Mt. Vernon | 2 p.m., June | 8.. Grading 2 1/2 miles | A. L. Strong, Co. Engr. | |
| Ind., Noblesville | June | 8.. 3 miles concrete boulevard to cost \$53,000..... | Hamilton Co. Comrs. | |
| Ind., Knox | Noon, June | 8.. Grading, paving and improving roads | C. W. Wenninger, Co. Aud. | |
| Ia., Mason City | 2 p.m., June | 8.. About 18,000 yds. grading | G. E. Frost, Co. Aud. | |
| Ind., Crawfordsville | 10 a.m., June | 8.. Grading, draining and paving roads | B. B. Engle, Co. Aud. | |
| Ind., Princeton | 10 a.m., June | 8.. Building five stone roads | W. T. Roberts, Co. Aud. | |
| Ind., Madison | 1 p.m., June | 8.. Gravel road construction | C. S. Dibler, Co. Aud. | |
| Ind., Delphi | Noon, June | 8.. Constructing roads | M. G. Haun, Co. Aud. | |

BIDS ASKED FOR

| STATE | CITY | REC'D UNTIL | NATURE OF WORK | ADDRESS INQUIRIES TO |
|----------|------------------|-----------------|---|--|
| Ind. | Bloomington | 2 p.m., June | 8.. Constructing gravel road..... | W. F. Kinser, Co. Aud. |
| Ind. | Bedford | 1 p.m., June | 8.. Constructing gravel road..... | E. W. Edwards, Co. Aud. |
| Ind. | Rochester | 2 p.m., June | 8.. Constructing gravel road..... | William C. Miller, Co. Aud. |
| Ind. | Corydon | 2 p.m., June | 8.. Constructing macadam road..... | J. L. O'Bannon, Co. Aud. |
| Ind. | Washington | 2 p.m., June | 8.. Constructing four pike roads..... | L. S. Core, Co. Aud. |
| N. D. | Manning | 2 p.m., June | 8.. Grading several roads | Commissioners of Dunn Co. |
| N. J. | Rahway | 8 p.m., June | 8.. Street paving | Common Council. |
| O. | Youngstown | Noon, June | 8.. Grading and paving streets..... | H. C. Fox, Clk. |
| N. J. | Princeton | June | 8.. Paving with asphalt, asphalt blk. or bitu. material..... | Borough Clerk |
| Ind. | South Bend | 10 a.m., June | 8.. Grad., macadamizing and graveling & laying sidewalks and curbs | Veronica C. Sweeney, Clk. B. P. W. |
| N. J. | Atco | 8 p.m., June | 8.. Grading, excavating and curbing..... | J. E. Winters, Twp. Clk. |
| Wash. | Seattle | June | 9.. Wood block paving to cost \$7,000..... | C. E. Remsburg, Sec. Pt. Com. |
| N. C. | Bolivia | June | 9.. Constructing seven miles sand-clay road..... | Dr. E. G. Goodman, Chairman. |
| N. Y. | New York | 11 a.m., June | 9.. Regulating and repaving with asphalt, granite block and wood block | L. H. Pounds, Boro. President. |
| Ind. | Crown Point | June | 9.. Constructing gravel roads..... | Edward Simon, Co. Aud. |
| Ind. | Fowler | 1 p.m., June | 9.. Road construction..... | Warren Mankey, Co. Aud. |
| Ind. | Shelbyville | June | 9.. Grading and graveling road..... | F. W. Fagel, Co. Aud. |
| O. | Struthers | Noon, June | 9.. Brick pavements on two streets..... | Jonah Richards, Vll. Clk. |
| Minn. | St. James | 1 p.m., June | 9.. 23 miles road construction, 57,000 yds. grading, 78,000 ft. turnpiking, etc..... | J. C. Jensen, Co. Aud. |
| Mont. | Roundup | Noon, June | 10.. Gravelling road; developing county roads..... | F. E. Ranshaw, Clk. & Rec. |
| Kan. | Hutchinson | Noon, June | 10.. Road improvements | County Engineer. |
| Wis. | Superior | June | 10.. Improving and repaving streets..... | A. F. Chadwick, Chr. B. P. W. |
| Ida. | Sandpoint | June | 10.. 18,000 yds. paving on 5-in. concrete base..... | City Clerk. |
| Pa. | Pittsburgh | 10 a.m., June | 10.. Improving 11 miles of road..... | H. M. Cribbs, Co. Controller |
| O. | Niles | Noon, June | 10.. Grading, paving and curbing four streets..... | J. N. Cowdery, Dir. P. S. |
| Ind. | La Porte | 10 a.m., June | 10.. Grading, paving and improving road..... | F. A. Husheer, LaPorte Co. Aud. |
| O. | Cincinnati | noon, June | 11.. Repairs to 25,300 ft. of road..... | Albert Reinhardt, Clk. Bd. Co. Comrs. |
| Minn. | R. Lake Falls | 1.30 p.m., June | 11.. Clearing and grading and surfacing roads..... | George Dupont, Co. Aud. |
| Mo. | St. Louis | Noon, June | 11.. Paving with vitrified brick..... | W. T. Findly, Sec. Bd. P. Ser. |
| Wis. | Racine | 10 a.m., June | 12.. Paving with brick..... | P. H. Connolly, City Mgr. |
| O. | Berlin Centre | 3 p.m., June | 12.. Grading and macadamizing streets..... | S. M. Rakestraw, Clk. |
| O. | Wapakoneta | 1 p.m., June | 12.. Road improvement..... | J. H. Meyer, Co. Surv. |
| Ind. | Kentland | 2 p.m., June | 12.. Grading, paving and improving | S. R. Sizelove, Newton Co. Aud. |
| Wis. | Two Rivers | 7.30 p.m., June | 12.. Grading, curbing and macadamizing..... | Board Public Works. |
| Wis. | Wauwatosa | 1 p.m., June | 12.. Grading, curbing and paving with waterbound macadam..... | City Clerk. |
| N. J. | East Orange | 8 p.m., June | 14.. Concrete walk | L. E. Rowley, City Clerk. |
| N. J. | Newark | 3.30 p.m., June | 14.. Concrete road | Fredk. A. Reimer, Co. Engr. |
| Wash. | Vancouver | ..... | June 14.. 2,100 yds. paving and 450 ft. curb..... | B. L. Dorman, City Engr. |
| Mich. | Sault Ste Marie | 4 p.m., June | 14.. 12,000 yds. bit. coated concreted pavement..... | A. J. Eaton, Sec. B. P. W. |
| Wash. | Seattle | ..... | June 14.. Grading and graveling 8 miles of road..... | County Commissioners |
| Wash. | Olympia | ..... | June 14.. Clearing, grading & draining 8.5 miles of road..... | State Hwy. Board |
| W. Va. | Grafton | 9 a.m., June | 14.. Improving several streets..... | M. R. Fortney, Clk. |
| Mich. | Sault Ste. Marie | 4 p.m., June | 14.. 12,000 yds. bitu. coated conc. pave., curbs & approaches..... | Ed. Pub. Wks., A. J. Eaton, Sec. |
| Neb. | Central City | 7.30 p.m., June | 14.. Cement crossings and walks..... | C. F. Newmyer, City Clk. |
| Vt. | Burlington | 2 p.m., June | 15.. Constructing walks, curbs and gutters..... | City Engineer. |
| Mich. | Detroit | ..... | June 15.. Excavating | City Engineer. |
| Md. | Princess Anne | ..... | June 15.. Constructing 4.4 miles state highway..... | State Hwy. Com., Baltimore. |
| Md. | Baltimore | ..... | Noon, June 15.. Building 4.4 miles of concrete road..... | O. B. Weller, State Roads Comm. |
| Minn. | St. Cloud | 3 p.m., June | 15.. 10,300 yds. concrete pavement..... | G. C. Magnuson, City Clk. |
| Pa. | Philadelphia | ..... | June 15.. 58,457 yds. bituminous pavement, 9,220 yds. vit. block, 17,490 ft. concrete curb and 7,257 ft. sewers..... | Dept. Public Works. |
| Minn. | St. Cloud | ..... | June 15.. 10,300 yds. paving | G. G. Magnuson, City Clk. |
| Ind. | Indianapolis | 10 a.m., June | 15.. Grading, paving and improving | W. T. Patten, Marion Co. Aud. |
| N. J. | N. Brunswick | 2.30 p.m., June | 15.. Bituminous concrete | A. B. Fox, Co. Engr., Perth Amboy. |
| N. Y. | Albany | 1 p.m., June | 16.. Improving highways in various counties..... | State Highway Commission. |
| O. | Cleveland | 10 a.m., June | 16.. Road improvement | E. G. Krause, Clk. Co. Comm. |
| Kan. | Ft. L'worth | 11 a.m., June | 16.. Concrete pavement, walk, curb and gutter..... | Cap. H. E. Comstock, Const. Q. M. |
| Tex. | Oakville | ..... | June 16.. Road construction to cost \$40,000..... | W. W. Caves, Co. Judge. |
| O. | Cincinnati | Noon, June | 18.. Improving roads | A. Reinhardt, Clk. Co. Com. |
| O. | Painesville | ..... | June 18.. 11.5 miles road construction..... | W. A. Davis, Sec. Co. Comrs. |
| O. | Steubenville | 1 p.m., June | 18.. Constructing road | County Auditor |
| N. Y. | Albany | 1 p.m., June | 18.. Improving about 84 miles highways in 12 counties..... | Edwin Duffey, State Hwy. Commissioner |
| Ind. | Bremen | ..... | June 18.. Paving curbing, draining and excavating..... | F. F. Knoblock, Twn Clk. |
| Wis. | Racine | 10 a.m., June | 19.. 3,200 cu. yds. grading..... | P. H. Connolly, City Engr. |
| O. | Mt. Vernon | ..... | June 19.. Grading, paving, draining, curbing..... | City Engineer. |
| Ala. | Selma | ..... | June 21.. Grading, draining and graveling 13½ miles..... | Board of Revenue. |
| La. | Baton Rouge | ..... | June 21.. Laying 170,000 yds. bituminous gravel with curbs, gutters, etc.; 22,000 yds. hard surface pavement on concrete base | J. J. Mundinger, City Engr. |
| O. | Cincinnati | Noon, June | 25.. Road improvements | Bd. of Hamilton Co. Comrs. |
| O. | Wyoming | ..... | June 25.. Cement sidewalks | G. H. Eversman, Vll. Clk. |
| O. | Columbus | ..... | June 26.. Constructing 4,045 ft. road | F. S. Miller, Clerk. |
| O. | Oak Hill | July | 1.. Curbing and paving; road construction | City Clerk. |
| SEWERAGE | | | | |
| Ind. | Eagle Grove | ..... | June 5.. Constructing tile drain | James Gross, Engr. |
| Wash. | Chehalis | 4 p.m., June | 7.. Constructing trunk sewers | City Commissioners |
| Minn. | Brainerd | 8 p.m., June | 7.. Constructing 6,800 ft. 8 to 18-in. sewers | A. Mahlum, City Clerk. |
| Ont. | Mille Roches | ..... | 7.. Constructing drain, estimated cost \$9,000..... | John Mullin, Town Clerk. |
| Pa. | Downington | ..... | 7.. Sewerage system and sewage disposal plant | Chas. McFadden, Sec. |
| Ia. | Webster City | 1.30 p.m., June | 7.. Constructing drainage ditch | A. J. Peterson, Co. Aud. |
| Ill. | Mendota | 8 p.m., June | 7.. Two cars 8 and 12-in. vit. cement tile (seconds) | Carl Widener, City Clk. |
| S. D. | Salem | 6 p.m., June | 7.. 800 ft. lateral sewers | Clyde H. King, City Aud. |
| Kan. | Kansas City | 10 a.m., June | 7.. Hydraulic dredge discharge pipe line | Kaw Valley Drainage Dist., Wyandotte Co., 719 Osage Ave. |
| Minn. | Duluth | 10 a.m., June | 7.. Sanitary sewer | J. A. Farrell, Comr. P. W. |
| Mass. | Boston | Noon, June | 8.. Sewerage works in sewers | Room 511, City Hall Annex. |
| Pa. | Beaver Falls | ..... | 8.. Sewage disposal plant and appurtenances | W. W. Piper, Supt. Pub. Imp. |
| O. | Youngstown | ..... | 8.. Sewering and draining several streets | H. C. Fox, Clerk. |
| Ore. | North Bend | ..... | 8.. Constructing sewer system | C. E. Maybee, Recorder |
| Mo. | Maplewood | ..... | 9.. Constructing about 5,000 ft. of 7-ft. tunnel sewer | M. F. O'Brien, City Clk. |
| O. | Toledo | ..... | 9.. Sewer construction | Director of Public Service |
| O. | Struthers | ..... | 9.. Constructing storm water and sanitary sewers | Jonah Richards, Vll. Clk. |
| N. J. | Trenton | 2.30 p.m., June | 9.. Constructing sewers and drains | Frank Thompson, City Clk. |
| Pa. | Montrose | ..... | 10.. Constructing sewers and sewage disposal plant | Borough Clerk. |
| O. | Cleveland | ..... | 10.. Sewers | A. R. Callow, Comr. P. & Sup. |
| O. | Springfield | 4 p.m., June | 11.. Sewage disposal at infirmary | Co. Aud. of Clark. Co. |

BIDS ASKED FOR

| STATE | CITY | REC'D UNTIL | NATURE OF WORK | ADDRESS INQUIRIES TO |
|---------------------------|------|----------------------|---|--|
| Minn., Elbow Lake | | June 11. | Drainage ditch construction..... | J. E. Cole, Morris. |
| O., Donnellsville | | June 11. | Constructing sewage disposal plant at Infirmary..... | Geo. McCord, Pres., c/o Co. Aud., Springfield. |
| Wis., Ripon | | 4 p.m., June 14. | 2,546 ft. 8-in. sanitary sewer..... | J. W. Pierce, City Clk. |
| Pa., Uniontown | | Noon, June 14. | Sanitary sewers | L. G. Moslener, Boro. Engr., Snowden Bldg., Brownsville, Pa. |
| Ind., South Bend | | 10 a.m., June 15. | Pipe sewer..... | Dept. Public Works. |
| S. D., Sisseton | | 2.30 p.m., June 15. | 30,395 ft. 8 to 15-in. vit. clay pipe, 78 manholes, 7 flush tanks and 6 lamps holes..... | Casper Kennedy, Mayor. |
| O., Columbus | | Noon, July 16. | Disposal plant and sewer system for Infirmary..... | John Scott, Clk. Co. Comrs. |
| N. J., Woodbridge | | 8.30 p.m., June 16. | 2,120 ft. 8 and 10-in. vit. pipe sewer..... | A. Keyes, Twp. Clk. |
| Mo., St. Louis | | Noon, June 18. | Constructing sewers in several streets..... | W. T. Flingly, Sec. B. P. S. |
| Ill., Chicago | | 11 a.m., June 18. | Constructing sewer system..... | E. J. Glackin, Sec. B. L. I. |
| Miss., Okolona | | June 18. | Constructing sewer system..... | J. H. Davis, City Clk. |
| WATER SUPPLY | | | | |
| Fla., Plant City | | June 5. | Water works equipment..... | E. W. Mays, Supt. W. W. Wks., Engrs., Des Moines, Ia. |
| Ia., Spillville | | 6 p.m., June 5. | Water mains and 30,000-gal. tank or 50,000-gal. reservoir..... | E. H. Burlingham, City Clk. |
| Ia., Oelwein | | June 7. | 4 and 6-in. c.i. pipe, specials, etc..... | Walter Gabler, Village Clerk |
| Neb., Winside | | 8 p.m., June 7. | Laying 1,200 ft. 4-in. c. i. main..... | W. W. Curtis, City Clk. |
| Ill., Ottawa | | 10 a.m., June 7. | Laying 4,035 ft. 4 and 6-in. c. i. pipe, 6 hydrants, etc..... | William Williams, Commissioner Water Supply |
| N. Y., New York | | 2 p.m., June 7. | Furnishing pig lead..... | W. G. Spaulding, City Clk. |
| N. Y., Lockport | | June 7. | Laying 10 to 12-in. water pipe..... | Jas. A. Farrell, Comr. P. W. W. D. Spaulding, City Clk. |
| Minn., Duluth | | 10 a.m., June 7. | 20-inch c. i. pipe on trestle..... | Wm. P. Lee, City Clerk |
| N. Y., Lockport | | 8 p.m., June 7. | 10 and 12-inch water pipe..... | J. T. Martin, City Sec. |
| N. J., Bayonne | | 4 p.m., June 8. | Laying 2,510 ft. 8-in. pipe, 7 hydrants, gates, boxes, etc..... | City Clerk |
| Tex., Temple | | 5 p.m., June 8. | Constructing gravity dam across Leon river..... | A. G. Alder, Engineer. |
| Mo., Rockport | | June 10. | Installing waterworks system, cost \$12,000..... | Pease Engng. Co., Cleveland. |
| W. Va., Shepherdstown | | June 10. | Constructing water system to cost \$17,000..... | W. G. Clark, Spitzer Bldg., Toledo. |
| O., East View | | 11 a.m., June 14. | Laying water mains and constructing sidewalks..... | B. C. Brennan, City Engr. |
| O., Napoleon | | June 14. | Water softening and filter plant..... | H. P. Shoemaker, City Engr. |
| Wis., Kenosha | | June 14. | Constructing 42-in. c.i. intake pipe, 10,000 ft. long, intake crib and well..... | L. Lefebvre, Ch. Engr. Quebec Streams Commission. |
| Pa., Lock Haven | | 1 p.m., June 14. | Construction of portion of storage dam, including 560 yds. concrete and about 11,000 yds. earth excavation..... | K. A. Scheid, City Rec. |
| Que., Montreal | | noon, June 15. | Constructing storage water dam | G. F. Ashton, City Engr. |
| Utah, Salt Lake City | | 10 a.m., June 16. | Constructing 5,000,000-gal. reinforced conc. reservoir..... | G. W. O'Neal, City Secy. |
| Mass., Salem | | June 21. | Two 10,000,000-gallon steam pumps..... | Geo. W. O'Neal, City Secy. |
| Ark., Harrison | | June 25. | Water works to cost \$25,000..... | H. S. Dunlop, Vil. Clk. |
| Ark., Harrison | | June 25. | Water works to cost \$25,000..... | |
| O., Euclid | | Noon, June 28. | 6-inch water main | |
| LIGHTING AND POWER | | | | |
| Man., Winnipeg | | 10 a.m., June 5. | 150 kw. motor generator and exciter set..... | M. Peterson, Sec. Bd. Control. |
| N. J., Woodbridge | | 8 p.m., June 7. | Lighting streets for one year..... | Borough Clk. |
| N. C., Cape Fear | | 3 p.m., June 7. | Electric lighting plant | J. A. Wetmore, Act. Superv. Architect, Washington. |
| Ia., Alta Vista | | June 7. | Constructing transmission line and distribution system..... | F. Rabe, Town Clerk. |
| La., New Orleans | | 8 p.m., June 9. | Three horizontal return tube boilers..... | M. Loeb, Pres. Bd. of Port Comrs. |
| Ind., La Porte | | June 10. | Mechanical stokers for Court House Building..... | County Comrs. |
| O., Columbus | | Noon, June 11. | Replacing three boilers at sewage pumping station..... | G. A. Borden, Dir. P. S. |
| D. C., Washington | | July 3. | Extension to bldg. & install. new equip. at boiler plant..... | Bu. of Yds. & Docks, N. Dept. |
| Okla., Adamson | | Sept. 20. | Electric light plant..... | Frank Mann, Engr. |
| FIRE EQUIPMENT | | | | |
| N. J., Paulsboro | | June 8. | Two motor combination chemical and hose wagons..... | E. A. Struthers. |
| N. J., Millville | | 3.30 p.m., June 11. | Fire alarm and police signal system..... | R. B. Corson, Dir. P. Safety |
| N. Y., New York | | 10.30 a.m., June 14. | Furnishing and applying 26 2-wheel gasoline-driven tractors, 16 for fire engines and 10 hook and ladder trucks..... | Robt. Adamson, Fire Comr. |
| N. Y., Freeport | | June 16. | Furnishing 1,000 ft. rubber hose..... | H. E. Pearsall, Chief |
| D. C., Washington | | 10 a.m., June 22. | Rubber fire hose for Puget Sound, Wash., Navy Yard..... | S. McGowan, Paymaster Gen., U. S. Navy. |
| BRIDGES | | | | |
| Ill., Quincy | | 2 p.m., June 5. | Reinforced concrete bridge..... | L. L. Boyer, Co. Supt. Hwys. |
| Wis., Sheboygan | | 4 p.m., June 5. | 12-foot span concrete bridge | Jerry Donohue, Civil Engr. |
| O., Hamilton | | June 5. | 730-ft. span concrete bridge to cost \$120,000..... | County Commissioners |
| O., Zanesville | | 11 a.m., June 7. | Superstructure of bridge | F. C. Werner, Clk. of Comrs. |
| La., Lacombe | | June 7. | 150-foot span steel swing bridge to cost \$7,000..... | C. C. Sandoz, Sec. State Hwy. Comrs., New Orleans. |
| O., Chesapeake | | 10 a.m., June 7. | Laying floor on bridge..... | S. A. Bowman, Co. Aud. |
| N. J., Elizabeth | | 2.30 p.m., June 7. | 80-foot span concrete arch bridge | J. J. Bauer, Co. Engr. |
| Tex., St. Jo | | 8 p.m., June 7. | Steel or concrete bridge..... | D. C. Berry, Ch. St. Com. |
| Ind., Franklin | | 2 p.m., June 7. | Constructing two bridges..... | H. J. Knox, Co. Aud. |
| Ia., Montezuma | | June 7. | Constructing 9 steel bridges and 16 concrete culverts..... | W. C. McKee, Co. Aud. |
| Kan., Lincoln | | June 7. | One 35-ft. span and one 40-ft. span bridge..... | C. E. Boone, Co. Clk. |
| Minn., New Richmond | | 2 p.m., June 7. | One bridge and three concrete culverts..... | Theo. Peterson, Co. Aud., Waseca. |
| Minn., Fairmont | | 2 p.m., June 7. | Reinforced concrete bridge | D. C. Montgomery, Town Clk. |
| Ind., Hartford City | | 2 p.m., June 7. | Constructing concrete bridge..... | J. L. McGeath, Co. Aud. |
| N. C., Bryson City | | June 7. | 200-foot span bridge, steel or concrete..... | T. M. Howerton, Engineer. |
| Pa., Jermyn | | 7.30 p.m., June 7. | Two bridges over Rushbrook Creek..... | Robert Hall, Boro. Secy. |
| Va., Woodstock | | Noon, June 7. | 231-ft. span steel bridge..... | Clerk of Circuit Court |
| Ont., York | | Noon, June 7. | Reinforced concrete beam bridge..... | Frank Barber, Twp. Engr., 57 Adelaide St., Toronto |
| Pa., Glenolden | | June 7.. | Constructing reinforced concrete bridge..... | J. M. Quinn, Deputy Co. Cont. Media. |
| Ky., Henderson | | June 7.. | 11 steel and concrete bridges..... | S. H. Kimmell, Co. Rd. Engr. |
| Wash., Shelton | | June 7.. | 94.5-foot span deck Howe truss..... | Eva Robinson, Co. Aud. |
| Ia., Sac City | | 4 p.m., June 7.. | Petaining wall | C. C. Jameson, City Clk. |
| Minn., Waseca | | 2 p.m., June 7.. | Three reinforced concrete culverts and 16-foot bridge..... | T. Peterson, Co. Aud. |
| Mo., Rockport | | 6 p.m., June 7.. | Concrete culvert | Clerk |
| Ind., Paoli | | 2 p.m., June 7.. | New floor on bridge | E. A. Palmer, Orange Co. Aud. |
| O., Mt. Washington | | Noon, June 7.. | Reconstruction and repair of bridges..... | Phil. P. Fosdick, Dir. Pub. Serv., Cincinnati, O. |
| Pa., Westchester | | June 7.. | Bridges | T. V. Ash, Chester Co. Cont. |
| O., Cincinnati | | Noon, June 7.. | Wooden bridge and pavement | P. Fosdick, Dir. Pub. Serv. |
| Pa., Pottsville | | 10 a.m., June 7.. | New bridge | J. F. Kantner, Schuykill Co. Cont. |
| Wash., Walla Walla | | 9 a.m., June 8.. | Reinforced concrete bridge | City Engineer. |
| Ind., Logansport | | June 8.. | Three reinforced concrete bridges | A. P. Flinn, Cass Co. Aud. |

BIDS ASKED FOR

| STATE | CITY | REC'D UNTIL | NATURE OF WORK | ADDRESS INQUIRIES TO |
|----------------------|-----------------------|-------------|---|--|
| O., Norwalk |10.30 a.m., June | 8.. | Bridge | Huron Co. Surv. |
| S. C., Greer |June | 8.. | 16-foot span concrete bridge. | Co. Comrs., Greenville. |
| Wash., Walla Walla |June | 8.. | Reinforced concrete bridge to cost \$2,000. | W. R. Rehorn, City Engr. |
| Minn., Dawson |2 p.m., June | 8.. | Steel and concrete bridge over Lacqui Parle River | Arthur Engstrand, Clerk. |
| N. D., Minnewaukon |2 p.m., June | 8.. | Four I-beams pile bridges. | W. E. Paulson, Co. Aud. |
| Kan., Eureka |Noon, June | 8.. | Concrete bridge. | Ira Whipple, Co. Clk. |
| Okla., Hanson |June | 8.. | 87-foot span steel bridge. | J. C. Blackard, Clk. |
| O., McArthur |Noon, June | 8.. | Constructing steel bridge. | C. W. Brown, Co. Aud. |
| O., Ottawa |2 p.m., June | 8.. | 40-foot span bridge with 47.5-foot roadway. | John Roose, Co. Aud. |
| Wash., Stevenson |1.30 p.m., June | 8.. | Bridge over Nelson Creek. | Charles H. Mellor, Co. Aud. |
| O., Norwalk |10.30 a.m., June | 8.. | Constructing bridge. | C. E. Bloomer, Co. Aud. |
| Wash., Seattle |June | 8.. | 90-ft. steel bridge, to cost \$10,000. | Byron Phelps, Clk. Co. Comrs. |
| Ind., Shelbyville |June | 8.. | Reinforced concrete bridges. | F. W. Fagel, Co. Aud. |
| Ind., Kokomo |2 p.m., June | 8.. | Concrete bridge. | E. B. Swift, Aud. Howard Co. |
| Cal., Stockton |10 a.m., June | 8.. | Bridges to cost \$130,000. | F. E. Quail, San Joaquin Co. Surv. |
| O., Hamilton |10 a.m., June | 9.. | Constructing concrete-steel bridge | W. W. Crawford, Co. Aud. |
| N. J., New Gretna |noon, June | 9.. | 742-foot steel truss drawbridge | James Logan, Co. Engr. |
| N. J., New Gretna |noon, June | 9.. | Repairing substructure of bridge | John K. Johnson, Chr. Bridge Comm., Atlantic City. |
| N. D., Carrington |2 p.m., June | 9.. | Three pile bridges. | M. Delfs, Chr. Committee. |
| N. J., Freehold |11 a.m., June | 9.. | Constructing and repairing bridges. | C. E. Close, Clk. of Board. |
| Kan., Great Bend |Noon, June | 9.. | Four bridges, 10 to 80-ft. span. | County Clerk |
| Kan., Great Bend |Noon, June | 9.. | Four highway bridges. | Barton Co. Clerk. |
| Ia., Iowa City |1.30 p.m., June | 9.. | Bridges | J. F. Freeman, Johnson Co. Aud. |
| Ind., Indiana Harbor |10 a.m., June | 9.. | Bridge approaches | E. Simon, Lake Co. Aud., Crown Point. |
| Neb., Ponca |2 p.m., June | 11.. | Constructing and repairing county bridges for one year. | A. M. Porter, Co. Clerk. |
| Ind., Richmond |11 a.m., June | 12.. | Constructing reinforced concrete culvert. | L. S. Bowman, Co. Aud. |
| O., Bucyrus |Noon, June | 12.. | 162-ft. span and three other bridges. | H. A. Bleibhauser, Co. Aud. |
| Ill., Danville |11 a.m., June | 12.. | 30-foot highway bridge | J. F. Fisher, Engr., Garrett Eldg. |
| Ont., Cayuga |June | 14.. | Ten reinforced conc. highway bridges, 6 to 32-ft. span. | Chairman Good Roads Comm. |
| Wash., Olympia |June | 14.. | 468-foot span steel cantilever. | State Highway Commission. |
| O., Ashland |Noon, June | 14.. | Constructing several bridges. | Bess Welty, Clk. Co. Comrs. |
| O., Sidney |June | 15.. | 20-foot span concrete arch bridge. | G. P. Staley, Co. Aud. |
| Tex., Laredo |10 a.m., June | 15.. | Two reinforced concrete bridges. | J. S. Westbrook, Chr. of Com. |
| Md., Baltimore |June | 15.. | two 98-foot span bridges. | State Roads Commission. |
| Pa., Milroy |10 a.m., June | 16.. | Constructing three reinforced concrete bridges. | Township Supervisors. |
| Ga., Rome |June | 16.. | Tearing down and rebuilding 3 bridges. | J. D. Pollock, Chr. Roads & Revenues Commission. |
| O., Cincinnati |Noon, June | 18.. | Concrete retaining wall | F. E. Wesselmann, Pres. Hamilton Co. Comrs. |
| O., Hamilton |10 a.m., June | 19.. | Constructing concrete bridge | W. W. Crawford, Co. Aud. |
| O., Clinton |11 a.m., June | 21.. | Reconstructing abutment | C. L. Bower, Summit Co. Clk. |
| Minn., Little Falls |2 p.m., June | 22.. | Reinforced concrete culvert | B. Y. McNairy. |
| Wash., Seattle |June | 25.. | Two steel draw bridges to cost \$880,000. | A. L. Valentine, Chr. B. P. W. |
| Ore., Gold Beach |July | 7.. | Reconstructing Elk River bridge. | J. M. Caughell, Co. Engr. |
| MISCELLANEOUS | | | | |
| Minn., Mantorville |June | 5.. | Furnishing elevating road grader. | Co. Aud. |
| Ia., Webster City |1.30 p.m., June | 7.. | Constructing drainage ditch | A. J. Peterson, Co. Aud. |
| Cal., San Jose |11 a.m., June | 7.. | Furnishing 50,000 bbls. Portland cement. | H. A. Pfaster, City Clk |
| N. D., Cooperstown |June | 7.. | Cement work for 1915. | G. B. Edmondson, City Aud. |
| Ind., Shelbyville |10 a.m., June | 8.. | Erecting two fire-escapes. | F. W. Fagel, Co. Aud. |
| N. Y., New York |Noon, June | 8.. | Building pier at foot of 29th street. | R. A. C. Smith, Comr. of Docks |
| D. C., Washington |June | 8.. | Supplies for Navy Department. | Bu. of Sups. & Accts. |
| Ariz., Fort Huachuca |June | 9.. | Electric light and refrigerating plant. | Constr. Q. M. |
| N. Y., Binghamton |4 p.m., June | 9.. | Furnishing 1,200 gals. wood preserving oil. | D. W. Fosdick, Clk. |
| Fla., Jacksonville |Noon, June | 10.. | Foundations for sheds on municipal piers. | F. W. Bruce, Chief Engr. |
| N. Y., New York |June | 11.. | Equipment and materials for Brooklyn elevated line. | Public Service Commission. |
| N. Y., New York |Noon, June | 11.. | Constructing pier | R. A. C. Smith, Comr. Docks. |
| D. C., Washington |June | 15.. | Supplies for Navy Department. | Bu. of Sups. & Accts. |
| N. J., Trenton |Noon, June | 15.. | Barnegat-Manasquan Canal construction. | W. A. Maupay, Comr. Inland Waterways. |
| D. C., Washington |2 p.m., June | 21.. | Construction Postoffice at Cuero, Texas. | J. A. Wetmore, Act. Sup. Arch. |
| O., Hamilton |10 a.m., June | 23.. | Constructing revetment | W. W. Crawford, Co. Aud. |
| D. C., Washington |3 p.m., June | 24.. | Construction complete of Post Office at Mt. Vernon, N. Y. | J. A. Wetmore, Acting Supv. Architect. |

STREETS AND ROADS

Birmingham, Ala.—Lamar County proposes to build a system of good roads to permeate all districts of county.

Gadsden, Ala.—The first formal session of Etowah County Road Commission is being held to select road engineer. Actual work on construction of roads will be under way in two months. Cost will be \$200,000.

Gadsden, Ala.—A delegation of 50 or 60 residents of Boaz and Marshall County has appeared before Highway Commission asking that road from Gadsden to Marshall County line be improved with portion of \$200,000 bond issue.

Montgomery, Ala.—R. P. Boyd, assistant highway engineer, is in Evergreen, conferring with board of commissioners of Conecuh County relative to letting contract for new highway in that county. This road is to cost \$11,000.

Florence, Ariz.—By vote of approximately 5 to 1 proposed Pinal County road bond issue of \$150,000 was approved. In Casa Grande, Maricopa, Red Rock and Kelvin bonds had almost no opposition. About \$60,000 of proceeds will be expended on a road from Kelvin to Ray, where a number of new bridges are necessary. The remaining \$90,000 will be spent chiefly in constructing a road from Superior west to the Maricopa County line, and in bridging the Gila at Kelvin.

Nevada City, Cal.—A campaign is about to be launched here by city trustees for better sidewalks.

Sacramento, Cal.—The voters of California will have opportunity in November, 1916, of approving proposition to issue \$15,000,000 in bonds for completion of state highway system. Governor Hiram Johnson has signed assembly bill 1596, which provides for completion of system and construction of 7 new laterals connecting coast and interior trunk lines in various counties.

Salinas, Cal.—Necessary resolutions have been passed to improve Alisal St. for its entire length. Calling for total expenditure exceeding \$25,000, Alisal St. is to be paved with crushed rock, oiled and packed. Concrete gutters are to be included. It will be most extensive single piece of street work yet accomplished by present council.

San Francisco, Cal.—The paving of McAllister St., between Parker Ave. and Stanyan St. has been decided on by Supervisors' street committee.

Stockton, Cal.—Property owners of district bounded by North, El Dorado and Wyandotte Sts. and Lower Sacramento Road, are circulating petition asking that oil macadam be used instead of asphalt concrete for streets to be improved.

Bridgeport, Conn.—Bids for annual supply of trap rock for Public Works Department have been received in office of Board of Contract and Supply. The desired quantity is somewhat near 9,750

tons and will cost approximately \$15,000. After bids were opened clerk began lengthy work of tabulating them. There were five bidders, as follows: Iron Ledge Quarry Co., Bridgeport; New Haven Trap Rock Co., New Haven; The York Hill Trap Rock Quarry Co., Meriden; The Connecticut Quarries Co., New Haven, and the Haverstraw Crushed Stone Co., New York. The tabulated bids will be referred to Director Jacob A. Courtade and contract awarded shortly.

Illinois.—Proposals for state aid road work in Illinois, letting advertised for May 26, 1915, were opened by state highway commission, and the following are low bids received: Rees Bros., Quincy, Ill., Calhoun County, Sec. A, macadam, \$2,000; H. H. Hall Construction Co., E. St. Louis, Ill., St. Clair County, Sec. A, concrete, \$16,900; Ajax Construction & Engineering Co., Gary, Ind., Marshall County, Sec. B, concrete, \$4,395; Capperine & Deyo, Bradford, Ill., Marshall County, Sec. C, bridges, \$5,972; W. E. Cummings, Geneva, Ill., Kane County, Sec. B, road and bridge, \$2,237.

Quincy, Ill.—Resolution has been passed instructing board of public works to macadam Cherry St., from 6th to 12th Sts.

Connersville, Ind.—\$6,800 of 4½ per cent Fayette County gravel road bonds have been sold to First National Bank.

Delphi, Ind.—William Mahoney Road (Deer Creek Township) bond issue of \$8,500 has been sold to J. F. Wild & Co., Indianapolis.

Goshen, Ind.—Elkhart County is preparing to issue bonds to amount of about \$200,000 to build new highways this summer. The cost of Ft. Wayne road improvement alone will be \$70,000. It is 5 miles long and is part of Lincoln highway route from Ligonier to Goshen.

La Porte, Ind.—Board of public works will improve Lincoln Way East and Lincoln Way by paving with brick, creosoted wood block, or sheet asphalt.

Mt. Vernon, Ind.—Farmers Bank, of Rockport, Ind., has purchased Robb Township gravel road bonds, amounting to \$1,900, paying 20 cts., a \$100 premium.

Plymouth, Ind.—County treasurer has sold \$56,000 highway improvement bonds for par and interest. The Fletcher American National Bank, of Indianapolis, was purchaser.

Rushville, Ind.—The county treasurer has sold a \$16,720 road bond issue to Rushville National Bank.

Vincennes, Ind.—County Treasurer E. P. Blann sold \$11,500 bond issue on the J. B. Johnson gravel road, in Washington Township, to Merchants National Bank, of Muncie, Ind., at total premium of \$14.50.

Waterloo, Ia.—Resolution for paving certain streets which will be presented to council will call for bids on both asphalt and asphaltic concrete.

Horton, Kan.—John O'Dell, of Horton, wants catalogues and prices of steam or electric concrete tile machines.

Carlisle, Ky.—The Nicholas Fiscal Court has rejected all bids which were received for sale of the \$125,000 turnpike bonds and has readvertised bonds for sale on June 2. There were five bidders and bidders were as follows: James Wilson, of Louisville; Stacy & Baum, of Toledo, O.; Hoehler, Cummons & Pruden, of Chicago, and the Deposit Bank of Carlisle.

Carlisle, Ky.—Work will begin on reconstruction of roads of Nicholas County about June 1. County Judge Mitchell has stated that court would be ready to make road contracts in about ten days. Engineer Norton will present plans, specifications and profiles of 50 miles of Nicholas County road to State Road Department, State aid having been asked. County proposes to build 50 miles of road this year.

Fulton, Ky.—The \$300,000 good roads bond issue election which was to have been held May 22 has been postponed on account of failure of petition to provide for special registration day. Petition, it is understood, was prepared by County Attorney J. W. Roney. As soon as another petition can be prepared, election will be called.

Middlesboro, Ky.—The good roads movement is making a clean sweep in Southeastern Kentucky. Beginning with Bell, and moving westward, five nearest counties have voted large bond issues by immense majorities. Now McCreary County, the next in order, has called election for July 10, to vote upon bond issue of \$100,000, for road building purposes. Wayne, next county west of McCreary, is likely to hold a road election about the same time, a petition for this having been circulated during past few days.

Morehead, Ky.—The Fiscal Court has voted to circulate petitions for calling of election in November for purpose of voting \$100,000 bond issue for road building in Rowan County.

Portland, Me.—At least a portion of State highway, between Portland and Dunstan, to be built this year, is to be constructed of concrete. This has been definitely decided by state highway commission after careful investigation of conditions. This section will be two miles, beginning at Ligonier, in South Portland, and continuing to Scarborough line.

Ashfield, Mass.—State highway commission has allotted \$1,500 to town to be spent on South Ashfield Road, \$1,000 having been raised by town at annual March meeting for that purpose.

Grand Rapids, Mich.—Upon recommendation of new ways and means committee, council has adopted ward street improvement estimates for the year, placing limit at \$300,000, for which bonds may be issued. Mayor figures that \$375,000 may be the limit.

Eveleth, Minn.—Bids are to be opened at next meeting of City Council for paving of Monroe, Pierce, Jones and Jackson Sts. There is some difference of opinion as to best kind of paving to use and Council has invited all property owners and others interested to be present and give their ideas before contract is let. Contractors have been asked to bid on concrete, creosote, block, brick, hillside brick and sandstone and to submit samples.

St. Paul, Minn.—City contracting committee has opened bids for contract work for paving of Lexington Ave., from Summit Ave. to Como Park; portions of South Wabasha St., and Fairview Ave., from Selby to Marshall Aves. Bids were referred for tabulation. Engineer's estimate for paving of Lexington Ave. is \$130,304. A portion of this street, from University Ave. to Como Park, is to be paved with asphaltic concrete, and contractors submitted bids for use of both natural lake and oil asphalt for this portion. The General Contracting Co. bid for entire contract, providing natural lake asphalt is used, is \$131,090, and if oil asphalt is used, \$128,506. City Engineer Claussen declined to tell the contractors on which kind of asphalt his estimate is based. Fielding & Shepley bid \$126,140, if natural asphalt is used, and \$123,900, if oil asphalt is used. If city engineer's estimate is based on use of oil asphalt, both contractors' bids are below estimate. If estimate is based on use of natural lake asphalt, the Fielding & Shepley bid is more than \$4,000 below engineer's estimate. On South Wabasha paving contract engineer's estimate was \$49,226, and General Contracting Co. bid \$52,801. On Fairview job the engineer's estimate was \$4,254 and the General Contracting Co. bid \$4,787. Fielding & Shepley did not bid on either the South Wabasha or Fairview jobs. The bid of the Republic Co., of \$1,34½, was for 3½-in. block, and is 9½ cts. lower than any bid received for this size of block this year. On 4-in. creosoted block for the paving of Robert St., with a square yardage of 3,247, the Republic Creosoting Co. bid \$1.54. Bids opened recently for the 4-in. blocks for the paving of the Robert St. bridge were as follows: Chicago Creosoting Co., \$1.68, and the Kettle River Co., \$1.70 a sq. yd.

Chief River Falls, Minn.—Paving of about 13 blocks is being planned.

Carthage, Mo.—Committee of property owners and residents of Garrison Ave. appointed some time ago to confer with City Engineer Frank Newton and to make plans for converting that street into first-class thoroughfare, have drafted specifications for improvements sought.

Fremont, Neb.—Purchase of street sweeper is being discussed.

Fremont, Neb.—Resolution has been passed providing for purchase of street sprinkler and Board of Works has been instructed to enter into contract for same.

Kearney, Neb.—Kearney will pave Central Ave. The time of notice of publication of paving districts designated has expired. The Council will meet and advertise for bids on the work. The district extends from Railroad St. to the Lincoln Way.

Camden, N. J.—The finance committee of city council of city of Camden, N. J., will receive sealed proposals at 8 o'clock p. m., Monday evening, June 14, 1915, for the purchase of \$50,000 repavement bonds.

Camden, N. J.—An ordinance authorizing issuance of \$50,000 worth of municipal bonds for purpose of obtaining money from sale thereof, for repaving of certain paved streets in city of Camden.

Keppert, N. J.—Engineer George D. Cooper has been present with plans and specifications for laying of new cement road on Broad St. After carefully figuring the work it was found that cost for same will amount to \$31,387.65. After carefully considering matter the plans and suggestions were accepted and approved.

Newark, N. J.—Crest Drive, a narrow dirt road extending from South Orange Ave. to Washington Rock, in South Mountain Reservation, may be considerably widened and macadamized, probably Essex County Park Commission can find way to raise necessary funds.

Roselle, N. J.—Three petitions from property owners on Eighth Ave., between Chestnut St. and Wheatsheaf Rd., asking for opening and grading of the roadway, the laying of sidewalks, and the installation of sewer mains, have been received at meeting of Borough Council.

Bath, N. Y.—Bath village trustees have adopted resolution for boulevardizing West Washington Ave. Resolution was passed by board some days ago, since which time it was submitted to Highway Department. It was revised and returned to village board.

Gouverneur, N. Y.—Village board has called special election for Saturday, when proposition will be voted on to appropriate \$3,500 to build concrete road bed from 16 ft. width of road that will be constructed by A. J. Rockwood Co., in Clinton St.

Niagara Falls, N. Y.—Board has ordered city engineer to prepare estimate of cost for the paving of Eighth St., between Ferry and Walnut Aves., such estimate to be presented at next meeting.

Geneva, N. Y.—Board of Public Works has decided to resurface Exchange St. with asphalt in place of brick, as at first planned.

Niagara Falls, N. Y.—Contracts for the \$240,000 Chestnut Ridge highway will be let shortly by Highway Commissioner Duffy, according to statement in Albany. The 14-mile stretch of concrete highway will be made up into four contracts, thus insuring early completion.

Utica, N. Y.—Canvassed by City Engineer Kemper, paving bids of Harry W. Roberts & Co. were as follows: Holland Ave. (new), sheet asphalt, natural curb, \$20,018.10, and artificial curb, \$18,750.80; bitulithic, natural curb, \$21,524.50, and artificial curb, \$20,257.20; asphaltic concrete, natural curb, \$19,641.50, and artificial curb, \$18,374.20; and vitrified brick, natural curb, \$22,116.30; and artificial curb, \$20,849. Park Pl. (new), sheet asphalt, natural curb, \$7,225.10, and artificial curb, \$6,332.10; bitulithic, natural curb, \$7,601.90, and artificial curb, \$6,908.90; asphaltic concrete, natural curb, \$6,880.90, and artificial curb, \$6,187.90; vitrified brick, natural curb, \$7,828.50, and artificial curb, \$7,135.50. Huntington St. (resurfacing), sheet asphalt, \$3,087.40; bitulithic, \$3,505; and asphaltic concrete, \$2,965.60. Brinckerhoff Ave. (resurfacing), sheet asphalt, \$3,773.90; bitulithic, \$4,256.30; and asphaltic concrete, \$3,-

Greensboro, N. C.—At meeting of Board of Commissioners ordinance was passed by commissioners to pave S. Elm St. from Lee to Bragg Sts. Paving will be of Type C, asphalt concrete, and will cost \$1.20 per sq. yd.

Wilson, N. C.—See "Lighting and Power."

Girard, O.—Village council has passed resolution declaring it necessary to pave and improve East Main St.

Hamilton, O.—Bids have been received at office of City Auditor Ernst E. Erb for \$7,497.50 of 5 per cent, 5-year sidewalk improvement bonds; \$10,000 of 5 per cent, 5-year storm sewer improvement bonds, and \$12,000 of 5 per cent, 6-year improvement bonds issued for purpose of purchasing a road roller, stone crusher, street sprinkler and auto street sweeper, the entire issue aggregating \$29,497.50.

Massillon, O.—Bids will be received until 12 o'clock noon, June 21, 1915, for purchase of bonds of the City of Massillon, Ohio, in the sum of \$31,000. These bonds are issued for purpose of providing funds for paying the city's share of improving certain streets by paving the same, improving certain streets by constructing sewers upon the same, and by improving certain streets by constructing curbing, guttering and sidewalks upon the same. R. J. Krisher is City Auditor.

Massillon, O.—Bids will be received at office of city auditor, City of Middletown, O., until 12 o'clock noon, standard time, June 25, 1915, for purchase of bonds of City of Middletown, in aggregate amount of \$6,000. They are issued for purposes of resurfacing, repairing, grading and improving existing streets in City of Middletown, O.

Sandusky, O.—Resolutions have been adopted for construction of various sidewalks.

Xenia, O.—Road building equipment to be used in construction of new stretch of macadam on Jamestown Pike has been delivered to H. C. Sparks, member of firm of McGarey & Spahr, local contractors, to whom work was awarded. When completed this stretch of pike will give continuous stretch of fine macadamized road into Jamestown.

Beaver Falls, Pa.—On June 1 bond issue of \$100,000 will be voted on for paving of every important street and avenue in city.

Chester, Pa.—Plans for paving of ten different streets in this city are underway and it is expected that within a few weeks work will be started. At the meeting of council bids were received from Union Paving Co. and the Continental Public Works Co. Bids were announced and referred to city engineer for tabulation. Should Union Paving Co. be successful bidders they will pave streets below named with fibertine, and should other bidder receive contract, bituminous paving will be laid. The prices submitted by the Union Paving Co. were as follows: Edgmont Ave., from 24th St. to the city line, \$1.61 1-5 per sq. yd.; Wilson St., from Front to 6th St., \$1.53 1-5 per sq. yd.; 4th St., from

Central Ave. to Flower St., \$1.54 1-5 per sq. yd.; 9th St., Edgemont Ave. to West 9th St. bridge, \$1.54 1-5; 2d St., from Penn to Fulton Sts., \$1.61 1-5; Flower St., from 2d to 3d Sts., \$1.59 1-5; 19th St., from Hyatt St. to Washington Boulevard, \$1.54 1-5; Caldwell St., from 3d to 6th Sts., \$1.59 1-5; 24th St., from Edgemont Ave. to Crosby St., \$1.57 1-5; Penn St., from Front to 3d Sts., \$1.61 1-5. Continental Public Works Co. submitted the following bids: Edgemont Ave., 24th St. to city line, \$1.64 per sq. yd.; 4th St., Central Ave. to Flower St., \$1.45; Caldwell St., from 3d to 6th Sts., \$1.45; 9th St., from Edgemont Ave. to 9th St. bridge, \$1.46; 24th St., from Edgemont Ave. to Crosby St., \$1.52; Penn St., from Front to 3d Sts., \$1.67; 2d St., from Penn to Fulton Sts., \$1.75; Flower St., from 2d to 3d Sts., \$1.55; 19th St., from Hyatt St. to Washington Boulevard, \$1.49; Wilson St., from Front to 6th Sts., \$1.57.

Erie, Pa.—Arrangements for grading, curbing, draining and paving of Brown's Ave., Liberty to Cascade Sts.; 21st St., from Liberty west to an alley 130 ft. west of Plum St., and of 21st St., from Cascade St. east 130 ft., were made in ordinance introduced into council by Director of Streets Eichhorn. The estimated cost of the work is \$12,600.

South Bethlehem, Pa.—Bethlehem Borough Council has passed North Main St. and Prospect Ave. paving ordinances on second reading.

Williamsport, Pa.—Arch St., Newberry, will likely be paved this summer.

Charleston, S. C.—City council has ratified 1915 schedule for permanent street improvements as submitted by committee on streets. Meeting St. is to be paved with sheet asphalt from Shepard St. to Mt. Pleasant St.

Bristol, Tenn.—Authority for issuance of \$16,000 worth of bonds for building of concrete streets in Holston Heights Improvement District will be incorporated in ordinance to be presented shortly.

Columbia, Tenn.—At meeting of board of mayor and aldermen all bids for pavement of main streets in business district were rejected and new ones will be advertised for in few days.

Knoxville, Tenn.—Bids will be advertised for contracts to pave improvement districts created on Atkins, Anderson, Callaway, Cumberland and Highland Aves. Recorder will advertise for bids for 15 days.

Texarkana, Tex.—Work of constructing \$400,000 worth of concrete highway in Greenville precinct of Hunt County has begun in earnest. Bonds to amount of \$300,000 have been sold for construction of good roads in Gregg County, in Longview precinct. At Marshall work has been commenced on building of improved highways included in contracts amounting to \$300,000. Grayson County property owners have recently voted \$900,000 for purpose of grading and graveling about 225 miles of highway in that county. A bond issue of \$190,000 for Nueches County is being sold and money will all be expended on good roads. Red River County taxpayers have already voted bond issue of \$300,000 for purpose of building roads which will connect with Lamar County highway.

Wichita Falls, Tex.—A contract for four and a half blocks of paving has been awarded by city council. It is expected that by time this work is completed other streets will be ready for pavement. Paving program for this year includes 26 blocks.

Ogden, Utah.—Roughly estimated, cost of building dirt boulevard 50 feet wide, on both sides of Ogden River, from west to east city limits, City Engineer Washington Jenkins says, is \$110,880.

Salt Lake City, Utah.—Approximately \$16,600 will be spent on roads in Millard County this year and road work when finished will complete 30-mile stretch of state highway between Delta and Fillmore.

Salt Lake City, Utah.—The state road commission plans road work in Tooele County in near future for which \$2,500 of state road funds designated to be spent for road improvements will be given. Improvements are proposed on stretch of road running south to Eureka and Juab Counties from Vernon, in Tooele County. Work will start at Clover and will extend south over about 20 miles of road to Vernon. An engineer of the road department is already at work on the road and it is said most of improvement will be done in grading.

Suffolk, Va.—Council of town of Smithfield has placed an order for 100,000 paving brick to begin work on paving Main St.

Kelso, Wash.—City of Castle Rock is asking for bids for paving of its business streets.

Tacoma, Wash.—Council has adopted resolution of intention to lay sidewalks in large North End district. About four miles of concrete sidewalks are contemplated, to cost approximately \$7,000. Final action will be taken June 7, when property owners can appear and protest at improvement, if they care to.

Wheeling, W. Va.—See "Water Supply."

Edgerton, Wis.—For construction of 4,485 sq. yds. concrete pavement, two lowest bids were: Lehmann Bros., Watertown, Wis., at \$3,187.85, and Geo. Nelson, Madison, Wis., at \$3,745.50.

Washburn, Wis.—Bayfield County will spend \$30,000 on its highway system this summer in addition to amount of state aid.

CONTRACTS AWARDED.

Huntsville, Ala.—For macadamizing road on mountain, to F. L. Powell, Huntsville, Ala., at \$11,500.

Vernon, Ala.—County Commissioners have let contract for position as County Engineer to P. S. Milner, of Birmingham. The county is preparing to spend \$150,000 on good roads right away.

Los Angeles, Cal.—For contract in Road District Improvement No. 35, to P. A. Thomas, at \$21,270.

Wilmington, Del.—Contract has been awarded the Barrett Mfg. Co., of Philadelphia, for 11,000 gallons of Tarvia for treating roads in Oakdale Cemetery.

Dade City, Fla.—Dade City and Pasco County have purchased from J. R. Southweller Construction Co. a 5-ton roller, a grader and four road scrapers. Price paid for these was \$308. Machinery will be used to keep the roads of the county and streets in repair.

Cedar Rapids, Ia.—For paving improvements, to Ford Paving Company, Cedar Rapids, Ia.

Clinton, Ia.—The Wheeling Corrugating Co., of Minneapolis, has been awarded contract for constructing corrugated iron culverts in Clinton County by Board of Supervisors. The contract price is \$3,748.84. Other proposals submitted were: Klauber Co., of Dubuque, \$4,380.32; Independence Culvert Co., of Independence, \$4,462.60; Russell Grader Co., of Ottumwa, \$4,778.68. Following is the proposal of the successful bidder in detail: 12-in. (452 ft.), 44 cts.; 15-in. (1,620 ft.), 62 cts.; 18-in. (432 ft.), 70 cts.; 21-in. (480 ft.), 98 cts.; 30-in. (380 ft.), \$1.65; 36-in. (330 ft.), \$1.96; 42-in. (216 ft.), \$2.31.

Muscatine, Ia.—Contracts have been awarded for grading on Muscatine County road system by Muscatine County Board of Supervisors. Wide range of bids was occasion of discussion on part of board. Bids had been asked by supervisors for grading in Montpelier Township and on road leading to Simpson bridge. Robert Garrett, of Wapello, was successful bidder for Montpelier job, while August Korneman, of this city, was awarded Simpson bridge job. Following bids were received: For Montpelier work: Robert Garrett, Wapello, 24 cts. per cu. yd.; Henry J. Fuller, Muscatine, 30 cts per cu. yd. August Korneman, Muscatine, 24½ cts. per cu. yd.; Fred Sieh, Montpelier, 40 cts. per cu. yd.; S. E. Kinsley, Muscatine, 28 cts. per cu. yd.; Eugene Keller, Montpelier, 44 cts. per cu. yd. For Simpson bridge: August Korneman, Muscatine, 17½ cts. per cu. yd.; O. W. Hintermeister, Muscatine, 18 cts. per cu. yd.; John F. Zybarth, Muscatine, 19¾ cts. per cu. yd.; S. E. Kinsley, Muscatine, 23 cts. per cu. yd.; George B. Fuller, Muscatine, 33⅓ cts. per cu. yd.

Rockwell City, Ia.—Council has awarded contract to Ford Construction Co., of Cedar Rapids, for 80,000 yards of sheet asphaltic paving at \$1.48 per yard, and 46,000 feet of curbing and guttering at 45 cents. Work is to be begun June 1 and completed November 1.

Storm Lake, Ia.—The Moore-Seig Co. of Waterloo has been awarded contract for paving of 51,920 sq. yds. of paving and 17,400 lin. ft. of curbing at recent meeting of city council. Contract price was sum of \$79,502.45.

Towson, Md.—For macadam paving contracts are as follows: Chesapeake Ave., to P. Reddington & Sons, 321 E. St. Paul St., Baltimore, at \$3,720; Bellona Ave., to U. D. Rich, 3205 Clifton St., Baltimore, at \$6,634; Malvern Ave., to C. B. Bowen, Towson, at \$3,612. W. G. Sucro, roads engineer, Towson.

Lowell, Mass.—Antonio Pallotto, of 117 Crosby St., Lowell's road builder and general contractor, has been awarded

contract of building state road in Salem and Derry, N. H. Road will be a macadam oil road, and will cost \$15,000. Work will begin next week.

Grand Rapids, Mich.—Close bidding featured contest by contractors for Colebrook St., N. E., culvert contract, awarded by board of public works to McDermott & Cooper, at \$17,946.80, while bid of J. P. Rusche was \$17,959.90.

Cape Girardeau, Mo.—John H. Rouse has been given contract for paving Pacific St. from Good Hope to Normal Ave., a distance of seven blocks, by Council. His bid was \$14,317.95, which was over \$1,200 less than next lowest, that of F. W. Keller. Specifications called for 21,450 cu. yds. of excavation, 14,771 sq. yds. of concrete, the use of the city roller, and 235 lin. yds. of curbing and gutters. Keller's bid was: Grading, \$906.50; concrete, \$14,475.58; roller, \$40; curbing, \$112.80; total, \$15,534.88. McMahon & McMahon, St. Louis: Grading, \$1,225; concrete, \$14,771; roller, \$80; curbing, \$117.50; total, \$16,193.50. Antone Haas: Grading, \$980; concrete, \$14,771; roller, \$40; curbing, \$117.50; total, \$15,908.50. J. H. Rouse: Grading, \$906.50; concrete, \$13,293.90; roller, \$40; curbing, \$77.50; total, \$14,317.95. Carmen & Bennett, Caruthersville: Grading, \$906.50; concrete, \$16,543.52; roller, \$40; curbing, \$117.50; total, \$17,607.52. Edward F. Reichenhardt: Grading, \$931; concrete, \$14,918.71; roller, \$40; curbing, \$96.35; total, \$15,986.06. Herman Loeffel had bid in also, but withdrew it before it was read.

Joplin, Mo.—Contract for paving of Sergeant Ave., from 4th to 5th Sts., has been awarded to Van Haften & Anderson at meeting of city council recently. Contracts on other blocks of this street were to have been awarded also, but through error in advertising they could not be acted upon until later. There were but two bids on work. The bid of Van Haften & Anderson was \$1.19 a sq. yd., and the Ozark Paving Co. had a bid of \$1.22 a sq. yd. The estimated cost of the work was \$1.30 a yd.

West Point, Neb.—Schlueter Bros., of Scribner, have been awarded contract for grading and cutting hills on eight miles of road in Grant Township. They have just begun work on similar six-mile job in Cleveland Township. Work in Cleveland and Grant Townships is continuous and will result in splendid highway between Wisner and Pender.

Camden, N. J.—To Aaron Ward & Son, contract for paving Wright Ave., Warren Ave. to Federal St., with Belgian blocks on 6-in. concrete base, for \$2.80 per sq. yd.

Westfield, N. J.—To Weldon Contracting Co., Rahway, at \$6,724, contract for grading and macadamizing streets.

Binghamton, N. Y.—Following highway contracts have been awarded for Delaware County in this highway division: Road 1270, Meriden-Delhi, Delaware County, to Samuel Beskin, of Beacon, for \$72,768. Road 1271, Colchester-Rockrift, Delaware County, to the Fulton Engineering Co., of Albany, for \$128,446.15. Road 1272, Colchester-Delancey, Delaware County, to E. J. Anderson, of Menanda, for \$63,898.

New York, N. Y.—For paving E. 174th St. from Southern Blvd. to Bryant Ave., to Asphalt Construction Co. at \$4,325; for improving Exterior Ave. from E. 151st St. to Jerome Ave., to J. Leopold at \$14,598, and Overing St. from Westchester to Walker Ave., to Di Minna & Di Blasio, at \$5,670.

Rochester, N. Y.—Contract for Roxboro Rd. asphalt pavement has been awarded to Julius Friedrich Co. for \$16,129.50. Contract for oiling the park roads went to Crouch Bros. for \$1,608.

Rome, N. Y.—The action of board of public works in contracting with Warren Bros. Co. for paving of Lawrence St. from S. James St. to barge canal for sum of \$24,597.20, has been approved by common council. The contract calls for paved street, 24 ft. wide and 2,538 ft. long. Bitulithic paving on 6-in. concrete base is to be used, and 5-in. Medina sandstone curbing is to be put in.

Schenectady, N. Y.—Paving contracts have been awarded to Union Paving and Schenectady Contracting companies by board of contract and supply for several new streets. The J. F. Shanley Co. also submitted bids. The bids were awarded as follows: Robinson St. to Schenectady Contracting Co.; Vermont Ave., to Union Paving Co.; Wright Ave., to Union Paving Co.; Hampton Ave., to Union Paving Co.; Avenue B, to Schenectady Contracting Co., and Oakwood Ave., to Union Paving Co. Charles W. Miller was awarded the contract for the grading of Wagner Ave., the other bidders being John Allen, Shear and Wilson, J. W. Kehoe and Kalteaux and DeNallo.

Syracuse, N. Y.—Several proposals have been received for supplying city with fluxed asphalt for street repairs at prices lower than those submitted earlier in the year, when contract was awarded at \$13.38 per barrel in wood containers to John Baker, Jr., of Buffalo.

Utica, N. Y.—N. D. Peters & Co. has been awarded contracts for constructing artificial stone sidewalks on Mason, Hickory, Cherry, York, James, Liberty and Albany Sts. and Jefferson, Howard and West Aves. Contracts for sidewalks on Auburn Ave. and Oak St. were awarded James F. O'Connor. Bids for sidewalks in front of Lot 22 on York St. and Allen St. were tabled. N. D. Peters & Co. were low bidders on former, and James F. O'Connor on the latter job.

Bryson City, N. C.—For constructing 8 miles of road in Swain County, to Phillips Munday, at approximately \$100,000.

Barnesville, O.—For construction of brick pavement, to Samuel Fowler, Barnesville, at \$1.12 per sq. yd.

Massillon, O.—Board of Control at meeting at city hall has awarded to the Studebaker Wagon Co., of South Bend, Ind., contract to furnish city with two street flushing machines for \$2,300. Flushers purchased by city are equipped with tanks with capacity of 750 gals. and 4-cylinder, 30-h.p. gasoline engines, which can develop pressure of 125 pounds per sq. in. Between 40 and 60 lbs. pressure will be needed to operate the machines.

Painesville, O.—By city, for about 3,000 sq. yds. brick paving with grout filler, to Gould & Maybach, 823 E 150th St., Cleveland, O., at \$6,281.19.

Sandusky, O.—Contracts for street improvements have been awarded by board of control. Work is apportioned as follows: Fulton St., between Market and Adams, Federal Asphalt Co., and between Water and Market, A. G. O'Donnell; Adams St., Federal Asphalt Co.; Wayne St., resurfacing, J. C. Devine Co.; South Columbus Ave., J. C. Devine Co., and Division St., J. C. Devine Co.

Wauseon, O.—By county commissioners for construction of Franklin Rd., Clinton Rd. and Dover Rd., to Kelly Construction Co., Bryan, O., for \$25,000; to Doan & Langundeofer, Toledo, for \$7,875, and to Zeller & Drum, Swanton, for \$6,699.

Oil City, Pa.—Lesher, Roess & Lesher, contractors, have been awarded contract for paving of Main St., in Rouseville, from southern limits of borough to top of Rynd Farm Hill. Work will cost approximately \$22,500. Paving has been divided into three sections, lower section at southern end of street will be of Bessemer brick, while remainder will be of Mack brick. Entire job will be on concrete base. Lower and upper sections will have concrete curb and gutter, while the section through the main part of the borough will have curb and gutter of stone.

Philadelphia, Pa.—Contract for repaving South St., between 2d and 27th St., with wood block, has been awarded to the McNichol Paving & Construction Co., at about \$90,000, or \$2.48 per sq. yd. This concern was also lowest bidder for wood block paving in Chestnut St., from 12th to 15th St., at \$2.79 per sq. yd., or total of \$15,000.

Scranton, Pa.—Out of 20 street improvement contracts awarded by the city of Scranton, Pa., 11 went to the Union Paving Co., of Schenectady, N. Y., theirs being lowest bid for the work.

Providence, R. I.—By State Board of Public Roads, for 10,000 sq. yds. penetration asphalt paving, following bids were received: Amos D. Bridges' Sons, Hazardsville, \$8,444; Lane Const. Corp., Meriden, Conn., \$8,563; Jos. McCormick, East Providence, R. I., \$9,257.60, and Oscar W. Rackle, Providence, R. I., \$9,283.20.

Providence, R. I.—Contract for reconstruction of 4,765 ft. of state highway in town of Warwick, between Greenwood and Apponaugh, has been awarded to Amos D. Bridges' Sons, Inc., of Hazardsville, Conn., by board of public roads. Contract price for the work was \$8,444. Bids on contract were opened by board at State House. The other bidders and their estimates follow: Joseph M. McCormick, \$9,257.60; Oscar W. Rackle, \$9,283.20; Lane Construction Corporation, Meriden, Conn., \$8,563.

Charleston, S. C.—Committee on streets has reported on awarding contracts for street paving as follows: That contract for creosoted wood block pavement be awarded to the Simons-Mayrant Co., of this city, they being lowest bidder, as follows: Long leaf yellow pine block: Depth of block, 3 in., 3½ in. 4 in.; base, 4

in., \$2.11, \$2.31, \$2.51 per sq. yd.; 5 in., \$2.23, \$2.43, \$2.63 per sq. yd.; 6 in., \$2.35, \$2.55, \$2.75 per sq. yd. Also that contract for asphalt pavements be awarded to Louis Lawson, Norfolk, Va., he being the lowest bidder, as follows: On sheet asphalt: On paint coat, depth on top, 1½ in., 2 in.; on 1½ in. binder, depth on top, 1½ in., 2 in.; base 4 in., \$1.31, \$1.43, \$1.43, \$1.55 per sq. yd.; 5 in., \$1.41, \$1.53, \$1.53, \$1.65 per sq. yd.; 6 in., \$1.51, \$1.63, \$1.63, \$1.75 per sq. yd. On asphalt concrete, on 2-in. top; Base, 4 in., \$1.30 per sq. yd.; 5 in., \$1.40 per sq. yd.; 6 in., \$1.50 per sq. yd. Brand of asphalt to be used is the "Axtect" brand.

Huron, S. D.—For construction of cement sidewalks, to P. Nelson & Son, Huron, S. D., at 12½ cts. per sq. ft.

Knoxville, Tenn.—Contract for street grading work in Park City for ensuing year has been awarded to Dan M. Carey, at adjourned meeting of Council. Mr. Carey will begin at once to grade sections of Harrison, Thompson, Bertrand Sts. and Selma and Pennsylvania Aves.

Ennis, Tex.—By City of Kaw Paving Co., of Topeka, Kan., for paving in Fire District following is itemized bid: 1,575 cu. yds. extra excavation (1,000 ft. haul), 35 cts.; 7,518 lin. ft. 24 in. concrete gutter, 25 cts.; 5,445 lin. ft. 18 in. concrete curb, 35 cts.; 169 lin. ft. special curb (retaining wall), 60 cts.; 515 lin. ft. 3x8 in. oak header in place, 15 cts.; 11 each standard manholes, complete, \$30; 25 each standard inlets, complete, \$20; 1 standard catch basin, complete, \$25; 1-135 lin. ft. 12 in. No. 2 vitr. tile pipe, 60 cts.; 828 lin. ft. 15 in. No. 2 vitr. tile pipe, 85 cts.; 100 lin. ft. 18 in. No. 2 vitr. tile pipe, \$1.05; 672 lin. ft. 20 in. No. 2 vitr. tile pipe, \$1.28; 336 lin. ft. 24 in. No. 2 vitr. tile pipe, \$1.80; 240 sq. yd. 6 in. 1:2:4 concrete pavement, \$1.12; 26,470 sq. yd. 3 in. vert. fibre brick pavement, 4 in. base, asphalt filler, \$1.86; total, \$57,940.

Salt Lake City, Utah.—Bids for grading capitol grounds have been opened at meeting of state capitol commission. Lowest bid was 16½ cts. a cu. yd. made by Utah Construction Co., of Ogden. It is estimated that amount of dirt to be moved from shoulder just east of capitol is 300,000 cu. yds., and it will cost approximately \$50,000.

Petersburg, Va.—To Central Construction Co., Harrisburg, Pa., at \$1.12 per sq. yd., for 3,000 sq. yds. asphaltic concrete pavement.

Richmond, Va.—Bids for doing grading work in Scott's Addition have been opened by Administrative Board and were ordered tabulated by City Engineer. Lowest bid was that of C. S. Luck, who offered to do the work for 19 cts. per cu. yd.

Wayne, W. Va.—By County Commissioners to Brubaker Contracting Co., Huntington, for constructing 3 miles of hard road between Four Pole and Twelve Pole, Cereds District, at \$54,000.

Kalama, Wash.—To N. P. Willis, Homuiam, Wash., at \$10,490 for Permanent Highway No. 1-A. Jeffery & Bufton, Union Ave. and E. Davis Sts., Portland, Ore., will improve Permanent Highway No. 2 for \$10,440.

Ellensburg, Wash.—By County Commissioners, Kittitas County, for paving and repaving 19.535 sq. yds. Dolarway Road, to Washington Paving Co., Savage-Scofield Building, Tacoma, at \$1 per sq. yd.

Kelso, Wash.—County Commissioners of Cowlitz County have let contract for constructing mile of Pacific highway between Kelso and Carrolls, to N. P. Willis, whose bid of \$10,490 on job was more than \$2,000 under next lowest bidder. Seven bids were submitted on contract. Bid of Jeffery & Bufton for construction of 6,860 ft. of concrete road on Permanent Highway No. 2, near Woodland, was accepted. This bid was for the sum of \$10,440.

Tacoma, Wash.—Contracts for two sidewalk improvements have been awarded by Owen Woods, commissioner of public works. The larger of the two, calling for sidewalks on South Alder and Cedar Sts. and Union Ave., went to M. P. Madsen for \$3,998. The engineer's estimate of the cost was \$4,998. Smaller job went to Silvertson & Williams for \$1,139 and provides for sidewalks on M St., between S. 48th and 56th Sts. Estimate of city engineer on this contract was \$1,431.

Tacoma, Wash.—To insure that way to Tacoma Speedway should not be blocked, county commissioners, in letting contract to pave part of permanent highway No. 6, known as Steilacoom Blvd., included proviso that one mile

of pavement must be completed before race dates. Contract for strip that extends east and west from corner of speedway to Custer, a distance of 1.67 miles, was awarded to the Washington Paving Co. on a bid of \$25,260. Bid specified use of bituminous pavement, with a 3½-in. bituminous base and a 1½-in. surface. The width of the road will be 16 ft. The 9 bidders included the Washington Paving Co., Andrew Erickson, the McHugh Contracting Co., P. McHugh, Jarvis & Garvey, Independent Asphalt Co., Joseph Warter, Sr., Anderson & Leljebeck and the Warren Construction Co. A contract for repair of county bridges at Delano Beach, Lake Bay, Dash Point, Picnic Point and Vaughn was awarded to D. W. Rutherford at an approximate total price of \$985.

Lake Geneva, Wis.—By city, for reinforced concrete pavement, to Geo. Welch, Beloit, Wis., at \$5,082.73.

Milwaukee, Wis.—By county highway commission for road construction as follows: Lake Rd., 20,700 cu. yds. excavation, 45,450 sq. yds. concrete paving, to Paul Gollinck, 887 23d Ave., city 33cts. for grading, 59½ cts. for paving, Beloit Rd., 6,270 cu. yds. excavation and 8,600 sq. yds. concrete paving, to Kroening Construction Co., Majestic Bldg., city, 35 cts. for grading, 53 cts. for paving and 6 cts. for extra reinforcement. North Cape Rd., 10,200 cu. yds. excavation, 35,500 sq. yds. concrete paving, to Delta Contracting Co., Escanaba, Mich., 23 cts. for grading and 78 cts. for paving. Layton Ave., 30,120 cu. yds. excavation and 22,900 sq. yds. concrete paving, to Milwaukee General Construction Co., 851 Eighth Ave., city, 45 cts. for grading and 59 cts. for paving, including reinforcing.

Superior, Wis.—Board has awarded contract for laying of 30,000 sq. ft. of cement paving at 10 cts and 7 cts. a sq. ft. to Gus Skamser. Paving is to be laid in 9th Ward. A contract for sidewalks to be constructed in 3d and 5th Wards has been let to Berg and Ranstein, contractors, on bid of 10 cts. per sq. ft. 3d Ward contract includes about 17,000 sq. ft., while 5th Ward job consists of 54,000 sq. ft. of walk.

SEWERAGE

Stockton, Cal.—Ordinance has been passed calling a special election on June 15 for the purpose of submitting to the qualified voters of city of Stockton, propositions of incurring a bonded debt amounting in aggregate to \$550,000 for certain municipal purposes and objects, to-wit: A bonded indebtedness in sum of \$200,000 for the acquisition, construction and completion of a storm water sewer system for the city of Stockton, including the acquisition of lands, rights of way and other property necessary therefor and a bonded indebtedness in sum of \$350,000 for the acquisition, construction and completion of a sanitary sewer system, including main sewers, outfall sewers and disposal works, lands, rights of way and other property necessary therefor. H. T. Compton is City Engr.

Quincy, Ill.—A public hearing for objectors to gigantic North End sewer proposition, ordered by Board of Local Improvements, will be held in city hall June 5 at 9 o'clock. Proposition entails expense of \$20,000.

Baltimore, Md.—State Board of Health will require the installation of part of Ocean City sewerage system this year. Plans and specifications for complete system have already been approved.

Cambridge, Md.—Plans have been approved by State Board of Health for complete sanitary and storm water sewerage systems.

Germantown, Md.—County Commissioners of Anne Arundel County will install sewerage system in Germantown. It is likely that State Board of Health will order construction of this system, so that funds may be raised at once.

Salisbury, Md.—Municipal authorities are considering question of having an accurate map of city made, and plans prepared for improving water, sewerage and sewage disposal systems. Robt. B. Morse is Chief Engr.

Beverly, Mass.—An order appropriating \$1,750 for construction of sewer on Pratt Ave. has been passed to second reading.

Milford, Mass.—Milford Sewer Commission has voted to add to construction of system here and bids will be asked for work to be done on Winter St. from Granite to Lincoln Sts., about 325 ft. Commission will receive bids for

this work up to June 1 at 8 o'clock in evening.

Springfield, Mass.—City will spend about \$50,000 in sewers in East Springfield.

Duluth, Minn.—Commissioner Farrell has introduced ordinance appropriating \$10,000 for storm sewers and \$13,000 for sanitary sewers to be constructed this year.

Duluth, Minn.—Negotiations are now in progress between city and officials of village of Proctor whereby residents of Duluth living on Bay View Heights may soon have sewer connections with sewer system of Proctor. It is thought probable that within a few days satisfactory arrangements may be made so that work may be begun. It is proposed to build main trunk sewer that will take care of residents of Vinland St. for distance of about 700 ft. east of Boundary Ave.

Camden, N. J.—Ordinance has been passed authorizing construction of sewers, culverts or drains in and along 28th St., from Carman St. to Mickle St.; Maryland, from Vanhook St. to Sheridan St.; Sheridan St., from Norris St. to the Municipal Hospital, and Ancona St., from Jefferson Ave. to Viola St., and in Viola St. and Winslow St., from Ancona St. to 4th St.

Camden, N. J.—Ordinance has been passed authorizing issuance of \$10,000 worth of bonds for purpose of obtaining money from sale thereof to lay out, construct and operate test experimental sewerage disposal or rendering plant in city of Camden.

Convent Station, N. J.—About June 1 city will receive bids for construction of sewer system estimated to cost \$20,000. Clyde Potts, 30 Church St., New York, N. Y., is engineer.

South Orange, N. J.—Construction of sewers in various streets have been planned.

Trenton, N. J.—Ordinances have been passed for construction of sewers in various streets.

Freeport, N. Y.—Citizens are contemplating issuing \$300,000 in bonds for the construction of sewer system and sewage disposal plant.

Mansfield, O.—Ordinances have been passed for construction of sewers in various streets.

Mansfield, O.—Resolution has been passed declaring it necessary to issue bonds for repairing and enlarging sanitary plant of city.

Salem, O.—Storm sewer system is being considered.

Portland, Ore.—City officials of Forest Grove are conferring with Calvin S. White, secretary of state board of health, on construction of a sewerage system in that city. Proposed drainage system will cover entire municipality.

Beaver Falls, Pa.—On June 1 bond issue of \$40,000 will be voted on for construction of sewer disposal plant.

Connellsburg, Pa.—Bond issue of \$30,000 for sewers is being discussed.

Erie, Pa.—Favorable reports on proposed screen system of sewage disposal have been made by Theodore Eichhorn, superintendent of streets, and B. E. Briggs, city engineer. As a result, city will establish system at foot of Dunn St. if council accepts recommendations of Superintendent Eichhorn.

Eric, Pa.—Mr. Eichhorn has provided press with list of improvements contemplated. They follow: Storm sewer in 23d St., Perry to Reed; Reed, from 23d to 26th; \$3,350. In 22d, Perry to Garrison Run; Perry, 22d to 23d; Perry, 23d to 25th; Perry, 25th to 26th; \$3,400. In 28th, Reed east to city line; Reed, 28th to 29th; \$4,000. In Pennsylvania Ave., 23d to 26th; \$1,000. In 23d, Garrison Run to Railroad St.; in Railroad, from 23d to Brandes; Brandes, from Railroad to 26th; \$2,500. Reconstruction of 9-in. sanitary sewer in Ash St., from 3d north 330 ft.; in 3d, Ash west 165 ft.; in Ash, from 3d south 135 ft., and in 3d, Ash east 280 ft.; \$4,200. Baldwin Bros., who are interested in above, agree to stand \$2,100 of cost, leaving the same amount to be paid by the city. Reconstruction of sewer in Walnut, 3d to 4th; Walnut to Cherry; \$2,500. Storm sewer in Plum, Front to 3d; 2d to 3d, from Plum to Liberty, \$1,900. In Hess Ave., 9th to Atkins, and west in Atkins to Lighthouse Run sewer; \$3,000. City portion of paving Raspberry St., 4th to 8th, \$2,500. Total, \$25,000.

Harrisburg, Pa.—Following State Health Commissioner Dixon's warning that Harrisburg's city government had not made ready to construct a sewage disposal plant in accordance with department's decree five years ago, a con-

ference probably will be held within a few days to complete plans for the plant. City Solicitor Seitz, Engineer Cowden and C. A. Emerson, of department's sanitary division, will discuss the matter. It is estimated that plant such as specified in original decree would cost from \$500,000 to \$1,000,000.

Williamport, Pa.—City council has passed on first reading ordinances for storm sewer in Campbell St., from Maynard Alley to West 3d St., and for house sewer in Menne Alley, from Elizabeth St. to Henrietta Alley.

Walterboro, S. C.—Public Service Commission of Walterboro has contracts for installation of sewer system and electric light plant, and extension and enlargement of water works system, for which \$45,000 in bonds was voted some time ago.

Brownwood, Tex.—Sewer bonds will be sold to pay for a crematory and septic tank.

Wheeling, W. Va.—See "Water Supply."

CONTRACTS AWARDED.

Sacramento, Cal.—To James Kennedy Construction Co., Los Angeles, at about \$105,000, for construction of Unit 5 of trunk line sewer, south of city.

West Palm Beach, Fla.—To Jonas & Garretson, at \$69,691, for construction of sewers and seawall, and improving various streets.

South Bend, Ind.—Lowest bid received for sewer construction was that of De Peape & Cousseus at bid of \$2,845.80.

Junction City, Kan.—For 3½ miles of sewers to W. W. Cook, Junction City, at \$8,905. Other bids: F. F. Ziegler, Junction City, \$10,132; O'Neil Contr. Co., Leavenworth, Kan., \$10,390; M. J. Stach, Kansas City, Mo., \$11,062. L. G. Gross is City Engr.

Shelburne Falls, Mass.—For construction of sewers, to Way & Cellini, Springfield. A. C. Bray is city clerk.

South Hadley Falls, Mass.—Sewer Commissioners have awarded contract for new sewers in Woodlawn District to James O'Connor Holyoke. Mr. O'Connor's bid was 52½ cts. a ft., flat rate for entire job, this including manholes.

Duluth, Minn.—The Duluth Builders' Supply Co. has submitted lowest bid on furnishing sewer material for season of 1915. The bids were opened in office of Secretary Culver of the works division. The proposals follow. Duluth Builders' Supply Co., \$18,694.89, and the Standard Salt & Cement Co., \$19,549.17. The contract will be awarded by Commissioner Farrell.

Eveleth, Minn.—By City Council, to Eveleth Const. Co., for laying sewer and water mains on Summit St., at \$3,157.

Newark, N. J.—By Passaic Valley Sewerage Comrs., Newark, for constructing northerly portion of Sect. 19, Aquackanck-Garfield-Passaic Branch Intercepting sewer, Boro, Garfield, to Harrison & Craig Co., Newark, \$61,740.

Palisades Park, N. J.—To Rudolph Garoni, Anderson Ave., Fort Lee, N. J., at \$50,934, for installation of sewer system to include about 40,600 ft. 8-in. to 12-in. pipe, Averill-Mathews Co., Essex Bldg., Newark, at \$4,980, was low bidder on disposal works, and Fred E. Gross & Son, Inc., 726 Palisade Ave., Yonkers, N. Y., at \$60,429, bid low for both contracts. L. Lozier is borough engineer, Hackensack.

Huntington, N. Y.—Frank Nordone, Proctors Bldg., Mt. Vernon, N. Y., at \$78,000, is low bidder for sewer system and sewage disposal works to include 15 miles vitrified pipe sewer, about 80 tons cast iron 14-in. pipe, sterilization devices, etc. Geo. W. Fuller is consulting engineer, 170 Broadway, New York City.

Long Island City, L. I., N. Y.—Bids have been opened for construction of two sewers in Queens, one in Palk Ave., Corona, from 51st St. to Junction Ave., and other in Van Alst Ave., Long Island City, from Broadway to Ridge St., and in Ridge St., from Van Alst Ave. to Ely Ave. Lowest bidder on former was Angelo Paino, at \$31,959.80, and on other the Green Contracting Co., \$3,330.55, who will receive awards for contracts.

Schenectady, N. Y.—Ellis B. Edgar has been awarded contract for laying of sewers in Gray St., Gerling St., Wagner Ave., Pinewood Ave., Sixth St. and over the park lands. The other bidders were John Allen, T. F. MacGregor, T. R. Crane, Kalteaux & De Nallo, Beckwith Bros.

Utica, N. Y.—Contract for building storm water sewer in Eagle St. to Domenico Piritano at \$670.25.

Ebensburg, Pa.—For construction of 4,900 ft. of 15-in. terra cotta sewer pipe, to W. W. Saupp Co., Altoona, Pa., at 81 cts. per lin. ft., and to Pitt Construction Co., Pittsburgh, Pa., for sewage disposal.

Edwardsville, Pa.—To D. M. Rosser, at \$16,582, for construction of sewers in the 5th and 6th Wards.

Greenville, Pa.—To Lesher, Roess & Lesher, Oil City, for construction of sewage disposal works, intercepting and lateral sewers. Estimated cost is \$43,000. Chester & Fleming, Pittsburgh, is engineer.

New Castle, Pa.—Contracts for O'Brien Ave. sanitary sewer and Smithfield St. storm sewer have been let by city council. Bids on these contracts were as follows: Engineer's estimate on O'Brien Ave. sanitary sewer, \$317.30; Burns Bros., \$317.74; F. M. Mayberry, \$31.96; C. E. Kimbrough, \$324.84. This contract was awarded to F. M. Mayberry, his bid being lowest. Engineer's estimate on Smithfield St. storm sewer, \$1,767.50; Burns Bros., \$1,328; F. M. Mayberry, \$1,477.40; C. E. Kimbrough, \$1,495; Charles Staph, \$1,782.50. Contract for this work was awarded to Burns Bros. at their bid of \$1,328.

Ogden, Utah.—The Wheelwright Construction Co. has been awarded contract for building sewer on Rushton Ave., between Quincy and Jackson Aves., at cost of \$1,038.80, which was lowest bid offered.

Beloit, Wis.—To Hansen & Nelson, Racine, at \$3,763, contract for constructing sewers in Sewer District "B."

Oconomowoc, Wis.—To A. C. Schrieter, of city, for \$1,366, contract for constructing storm sewers.

WATER SUPPLY

Benton, Ark.—Bids may be received about June 15 for construction of water, sewer and electric light systems. The estimated cost is \$100,000. R. C. Bailey is Mayor.

Alameda, Cal.—In order that city hall and library may be furnished with separate water system, plans are being made for boring of well at rear of city hall. It is estimated that project will pay dividend of from 12 to 15 per cent through savings in bills.

San Francisco, Cal.—Residents on Hudson Ave., between Land and Mendell Sts., have petitioned supervisors to direct Spring Valley Water Co. to lay 6-in. pipe instead of 2-in. one, which was torn up when block was graded recently.

Alton, Ill.—Petition filed in office of clerk of Circuit Court a few days ago by property owners in West Alton neighborhood indicates that preliminary steps have been taken to protect this fertile section of St. Charles County against the overflows of Mississippi River. Plan includes installation of monster cycloidal pump with capacity of 30,000 gals. a minute. The pump is to be placed at mouth of Brick House Slough and capacity of pump will be more than enough to take care of all surface water and seepage. Pump will probably be electrically driven and have attachments so that it will work automatically. Brick House Slough will be used as catch basin and will have waters from district drained into it as system of ditches.

Columbia, Ill.—Fuller-Coult Co., St. Louis, Mo., have prepared plans for construction of water and sewer systems. Estimated cost is \$12,671. E. H. Brucker is city clerk.

Bloomington, Ind.—A proposition of American Cast Iron Co., of Chicago, to complete municipal water works system at cost of \$90,000 will be considered by City Council. The city has already expended \$65,000 in building a mammoth dam, and the Chicago company's proposition is to furnish pipe line, lay same and also furnish boilers, engines, pumps and power house for \$90,000 and to have the work completed within 90 days.

Lawrence, Kan.—Resolution has been adopted in meeting of City Commissioners requesting receiver of water company to make certain improvements on water plant so that it will comply with franchise under which water company is operating. Following are points embodied in report: 1, providing an adequate supply of pure and wholesome water; 2, clean settling basins and stand pipe; 3, repair fire hydrants and valves; 4, extension of fire mains and hydrants as ordered; 5, additional pumping machinery; 6, additional feeder mains and fire protection.

Haverhill, Mass.—At meeting of water board it was voted to lay 2-in. high

service pipe from Fleet St. through fire engine house at corner of Fleet and Court Sts. to building occupied by the water board, provided an agreement is made with City Council that the city pay a part of expense. Pipe extensions were voted in following streets: To lay 350 ft. of 2-in. pipe in Orchard St., Bradford district; 185 ft. 6-in. pipe in Coral St.; 100 ft. 2-in. pipe in Hanson St.; 50 ft. 6-in. pipe in Victor St., and 375 ft. 6-in. pipe in Washington Ave.

Duluth, Minn.—Ordinance has been introduced appropriating \$4,900 for purchase of gas and water gates, boxes and hydrants.

Kirksville, Mo.—City commission will call bond election to vote on issue of \$70,000 to improve water system and to install complete street lighting system.

Bradley Beach, N. J.—Threatening to either build municipal water plant or to give borough franchise to another concern, Bradley Beach commissioners have passed resolution making several demands upon Monmouth Water Co. for more satisfactory service to people of borough.

Auburn, N. Y.—A proposition from Pitometer Co., of New York, for survey of water system of city, has been accepted at meeting of Auburn Water Board. The cost of survey will be \$3,000, which company guarantees to save by regulating flow of water to consumers.

Canton, N. Y.—A public meeting will be held on May 28 for purpose of discussing water supply of Canton village. Engineer Charles E. Perry, of Albany, will be present and speak on question, and opportunity will be given citizens to express their views. It has been deemed wise to hold meeting at this time as question of appropriating \$50,000 for a filtration plant will be voted on June 2 and much interest is manifested in outcome.

Lockport, N. Y.—The Water Board and Street Committee of Common Council have taken action favoring construction of new 12-in. water main in Market St., from Main to Exchange Sts., and a 10-in. main through Mill St., to plant of the Fiber Corporation.

Oswego, N. Y.—Request of Department of Water for special election on proposition of issuing \$35,000 in water bonds will be considered by Common Council. The Department of Water proposes to use money, if bond issue is authorized, in making improvements to water system. Extensions will be placed in streets where there are no services at present. Department has prepared list of extensions which it proposes to make and it will be forwarded to Council.

Oswego, N. Y.—Common council has designated Wednesday, June 16, as date for holding special taxpayers' election on proposition of issuing bonds for \$35,000 to make extensions and improvements to city's water system.

Warrenton, N. C.—Citizens have voted \$50,000 bonds for installation of water works and sewers.

Wilson, N. C.—See "Lighting and Power."

Middletown, O.—It has now been definitely decided by City Commission to postpone date for election on issue of \$120,000 worth of bonds for greater water works system for Middletown.

Springfield, O.—In accordance with instructions from city manager, Superintendent Cotter, of waterworks department, will begin distribution of 6-in. pipe today for approximately 4,000 ft. of new water main extensions. Part of extensions will be in eastern part of city and remainder in the Melrose addition. Extensions authorized are as follows: Harrison St., from Clark to Clairmont Ave.; Clairmont Ave., from Harrison to Elmwood Ave.; Raffensberger Ave., from High to Harrison St., and something over 800 ft. in Melrose, connecting with the main at Yellow Springs St.

Wellington, O.—Bond issue of \$35,000 for waterworks improvement carried at recent election. Filtration plant is proposed.

Gratz, Pa.—Permit has been issued for preliminary plans for pumping station, reservoir and pipe lines.

Walterboro, S. C.—See "Sewerage."

Mohrige, S. D.—Election will be held June 7, 8:30 p.m., to vote on water mains extension. C. A. Smith is mayor; W. L. Youngman is city auditor.

Fort Worth, Tex.—Fifteen 4½ per cent waterworks bonds, issued in 1909 and due in 1949, have been purchased by Finance Commissioner W. H. Smith, at saving to city in interest coupons of \$13,400.

Timpson, Tex.—Henry E. Elrod, engineer, Dallas, is preparing plans for proposed waterworks system.

Ogden, Utah.—On recommendation of Committee of the Whole, City Board of Commissioners has granted petition of Northwestern Investment Co. for water main extensions in Arlington Heights, between 19th and 20th Sts., and between Harrison and Van Buren Aves.

Wheeling, W. Va.—Extensive improvements will be made to Skelly track just east of Elm Grove, during next few weeks. Water mains will be installed, a lighting system, cement walks, sewerage, also installed, streets and grading will also be arranged. Improvements will cost in the neighborhood of \$12,000.

Wittenberg, Wis.—Bonds in sum of \$10,000 have been voted for water system.

CONTRACTS AWARDED.

Bellewood, Ill.—To Michael McElligott, Evanston, at \$1.16 per lin. ft. for laying 6-in. water mains in Morris and St. Paul Ave.

Nevada, Ia.—To J. P. Miller Artesian Well Co., Chicago, Ill., at \$10,220, for driving artesian well to depth of 2,000 ft. R. A. Davis is city clerk.

Laurel, Md.—To Thomas Hampton, Washington, D. C., for installation of water mains, filtration plant and sewage disposal plant. Harry Stevens is engineer, Washington, D. C.

Beverly, Mass.—Bids for furnishing public works department with hydrants and water gates and lead have been opened at meeting of City Council committee on public service at City Hall. The bids were as follows: Chapman Valve Mfg. Co., Boston—18-in. gates, \$72; 8-in., \$14; 18-in. hydrants, \$34.50. R. D. Wood & Co., Philadelphia—8-in. hydrants, \$33.98. Kennedy Valve Co., Elmira, N. Y.—18-in. gates, \$76.50; 8-in. gates, \$13.50; 8-in. hydrants, \$37.25. Pratt & Cady, Hartford—18-in. gates, \$62; 8-in. gates, \$13.50. Coffin Valve Co., Boston—18-in. gates, \$79.50; 8-in. gates, \$13.50. Lead—Chadwick Lead Co., Boston, \$4.39 per 100 pounds, melted pig lead, \$4.15 per 100 pounds; Richards & Co., \$4.42 per 100 pounds, with discount of ½ per cent for cash in 10 days. Committee awarded contract for pig lead to Chadwick Lead Co. and took other bids under advisement.

Shrewsbury, Mass.—To Hanscom Constr. Co., Boston, at \$62,000 for constructing complete water system, including stand pipe, pumping outfit, etc., 55 hydrants and 6 to 7 miles of pipe. Geo. E. Stone is Town Clk.

Orion, Mich.—For constructing water works to Traverse City Iron Works, Traverse City, at about \$16,900. Geo. M. Perry is Village Clk.

Orion, Mich.—Traverse City Iron Works Co., Traverse City, by city, for constructing water system.

Eveleth, Minn.—The Eveleth Construction Co. was low bidder for work of laying water mains and a sanitary sewer on Summit St. and the contract was awarded them. Their price was \$3,157.65.

Utica, N. Y.—To H. J. Bradeles Co., city, at \$18,200, contract to build pump house and for suction basin in river for proposed sprinkling system at County Home in city of Rome.

Cincinnati, O.—To National Water Main Cleaning Co., at \$19,712, by Board of Public Service, for furnishing c-i. pipe and specials and for cleaning water mains.

Middletown, O.—Lowest bidder on furnishing and laying 16-in. and 8-in. water mains was John Arff Co., at 70 cts. per ft. for 16-in. pipe and 35 cts. per ft. for 8-in. pipe.

Rocky River, O.—For furnishing material and installing water mains on North Ridge Rd., to Ross Cook Eng. Co., Akron, at about \$13,400. Frank Mitchell is Village Clk.

Sandusky, O.—M. J. Callan has been awarded contract for trenching and laying 6-in. water line in Washington Court. He offered to do excavating for 43 cts. per lin. ft.; water valves will be furnished for \$15 each. A. G. O'Donnell, other bidder, offered 88 cts. on excavating and \$20 on valves.

Harrisburg, Pa.—H. H. Fortney, of Newport, has been awarded contract for 290 ft. of corrugated iron pipe to be used on Peter's Mountain by County Commissioners. His bid was 54 cts. a ft. Other bidders were A. M. Smith, Halifax, 60 cts.; A. L. Greenberg Iron Co., 72 cts.; and W. F. Shoemaker, Hummelstown, 72 cts.

Philadelphia, Pa.—Lowest bidder for furnishing and laying cast iron pipe in South Philadelphia is E. Vare at \$399,963.65. About 7,200 tons of cast iron pipe will be required for this work.

LIGHTING AND POWER

Success, Ark.—Franchise has been granted to George Booser of Corning, Ark., to construct and operate electric light plant in Success. Energy will be supplied by Corning plant.

Loyalton, Cal.—As result of Engineer McLaren of State Railroad Commission making survey of this section, Town Trustees are considering installation of electric plant on Badenoch Creek. The engineer estimates plant could be installed for \$3,500.

Mountain View, Cal.—It has been decided to install new lighting system which will call for 40 of new type 250 candle-power lights. It will cost Pacific Gas & Electric Co. \$1,700 to install this system, and they agree to have it completed within two months after date of contract.

San Francisco, Cal.—The Third St. Improvement Club has petitioned supervisors to allow \$2,750 for extra lighting of Third St., from Market to Townsend, during coming fiscal year.

Williams, Cal.—Town has voted to establish lighting district, vote being 137 to 5 against. District will cover entire town of Williams and lights will be provided at every street intersection. Plant probably will be installed during September.

Washington, D. C.—The commercial attaché of Department of Commerce in Chile transmits report relative to opportunity for sale of machinery and supplies for electric lighting plant and tramway. Copies of this report may be had on application to Bureau or its branch offices, No. 16,950, Bureau of Manufactures.

Indianapolis, Ind.—The Citizens Gas Co. has been instructed by Board of Public Works to lay gas mains in Lincoln St., from Madison Ave. to Alabama St.; Euclid Ave., from Michigan St. to 2d alley north; Bosart Ave., from the 1st alley north of Michigan St. to a point 400 ft. north, and Ethel St., from 26th to 28th Sts.

Cumberland, Md.—City Council is considering improvements to municipal electric light plant at cost of about \$15,000. Plans include installation of a high-speed steam turbine, directly connected, and replacing present street lamps with new ones. W. M. Roberts, Jr., is Gen. Mgr. of municipal plant.

Grand Rapids, Mich.—Boulevard lights will be installed from Wealthy St. out Division Ave. to Hall St.

Springfield, Mo.—Boulevard lighting systems will be installed in Springfield this summer in Washington and Monroe Sts. and Capitol Ave.

Fremont, Neb.—Extension of city's electric lighting system is planned.

Rensselaer, N. Y.—Board of Trade has appointed a committee to request Council to replace present street lighting system with type of lamp used in Hudson.

Waynesville, N. C.—On May 4 citizens voted in favor of issuing \$25,000 in bonds to be used for installation of municipal electric light and power plant.

Wilson, N. C.—Board of Town Commissioners has called special election to be held July 6 for purpose of voting on proposition to issue municipal bonds for erection of gas plant; the grading and paving of streets and rebuilding the water system. Total bond issue will amount to \$250,000.

Port Clinton, O.—Council has approved of plans and has authorized contract for "white way" lighting system with the Northwestern Co.

Shelby, O.—City council and board of public affairs will install municipal electric light and power plant to cost about \$40,000.

Bromide, Okla.—Benham Engineering Co., consulting engineers, of Oklahoma City, will make investigations and prepare plans and estimates of cost for installation of electric lighting plant and water works system.

Stigler, Okla.—A proposition to vote J. P. Flanagan, of Tulsa, a franchise to furnish Stigler with natural gas will be voted upon June 22. If franchise carries Flanagan agrees to drill for gas near this city and establish modern plant.

Meadville, Pa.—Ornamental lighting system for business streets is being considered.

Walterboro, S. C.—See "Sewerage."

Wheeling, W. Va.—See "Water Supply."